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UltraNet Storage Director - eXtended

UltraNet™ Storage Director eXtended

Release 4.0

Hardware Installation Guide

P/N 620-000256-020 REV A

Simplifying Storage Network Management

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Record of Revisions and Updates

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620-000256-010	4/2006	Updated safety information.
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Preface

The intended audience for this document is anyone who is responsible for installing, maintaining, or operating the UltraNet Storage Director - eXtended system.

Organization of this Manual

This guide is organized as follows:

Chapter 1, *Hardware Installation* provides the procedures to install a USD-X.

Chapter 2, *Switches and Indicators* provides illustrations and descriptions of the USD-X hardware switches and indicators.

Chapter 3, *Maintenance Procedures* provides removal, installation, and replacement procedures for the hardware components.

Chapter 4, *Installing and Using WebView*provides information related to the installation and usage of McDATA's UltraNet WebView monitoring application. UltraNet WebView is an optional application.

Chapter 5, *Using the CD-RW Utility for Backups and Restores*provides information on how to use the CD-RW utility to perform backups and restores.

Chapter 6, *Using the Tape Utility for Backups and Restores*provides information on how to use the tape utility to perform backups and restores.

Appendix A, *HMB3 Board Default Settings*provides the port and factory default settings for the Hardware Monitor Board.

Appendix B, *Remote Support* provides the required settings for all parameters used in modem operation. This appendix also provides remote support configurations.

Appendix C, *WTI and Penril Switch Support*provides the cabling procedures, settings, and configuration parameters for the Penril and WTI switches. Additionally, it provides the Hardware Monitor Adapter (HMA2) jumper settings.

Appendix D, *RJ-45 Cables and DB Adapters* provides information on the RS-232 cables, RJ-45 connectors, and DB adapters available through McDATA.

Appendix E, *Fuse Voltage Information* provides the fuse voltage information for the F9106 and F9112 midplanes.

NOTE: The customer is responsible for ensuring conformance with power and specifications provided in this guide, for ensuring adherence to federal, state, and local building and electrical codes, for providing and installing communication cables on other vendors' equipment, and for providing a storage area.

Document Conventions

This manual uses the following conventions:

Italic text	Italicized text is used to emphasize information.
CTRL+C	Key combinations are indicated by keyboard key names and a plus sign, all of which are in small caps sans serif text. In the example given to the left, press and hold down the CTRL key and press C.
`Courier text`	Courier font is used for messages or program screen output that appears on your display.
`Bold Courier text`	Bold Courier text is used for commands (also, referred to as syntax statements) and system input that you type exactly as shown.
`< >` (angle brackets)	In commands, angle brackets indicate that the word contained within must be substituted with an actual value (do not type the angle brackets). In the following example, replace <filename> with the actual name of the file: **`check_release <filename>`**
`[ ]` (square brackets)	In commands, square brackets are used to indicate that the parameter contained within is optional. For example, in the following statement, the <module> parameter is optional: **`logcf get [<module>]`**

| (vertical bar)

In commands, a vertical bar is used between items in a list to indicate that you choose one of the items. For example, the vertical bar in the syntax statement below means you can use either the -u or the -q option (or neither):

```
swipplumb [-u|-q]
```

... (ellipsis)

An ellipsis in a command indicates that you can specify one or more of that <value> in the command. In the following example, the ellipsis within <module_name...> means that you can specify one module name or multiple module names.

```
get [<module_name...>]
```

For commands that have options such as -u, as in the following example, you must type -u before each filename if you wish to specify multiple file names:

```
[-u <filename>|-u <filename> -u <filename>...]
```

Related Documentation

This document is part of a book set for the UltraNet Storage Director - eXtended. The book set provides installation, operation, configuration, and reference information for system administrators and operators. The book set consists of:

- ***UltraNet Storage Director - eXtended Site Preparation User Guide*** (620-000258-000) provides information required for site pre-installation planning.
- ***UltraNet Command Reference*** (620-000255-000) provides a reference to the commands used for the UltraNet Storage Director, UltraNet Storage Director - eXtended, UltraNet Open Systems Director, UltraNet Storage Gateway, and UltraNet Open Systems Gateway.
- ***UltraNet Message Reference*** (620-000254-000) provides a reference to the messages produced by the UltraNet Storage Director, UltraNet Storage Director - eXtended, UltraNet Open Systems Director, UltraNet Storage Gateway, and UltraNet Open Systems Gateway.
- ***UltraNet Storage Director Configuration Wizards User Guide*** (620-000259-000) provides information for using the UltraNet configuration wizards to configure the UltraNet Storage Director.

Where to Get Help

For technical support, end-user customers should call the phone number located on the service label attached to the front or rear of the hardware product.

McDATA's "Best in Class" Solution Center provides a single point of contact for customers seeking help with McDATA software products. The Solution Center will research, explore, and resolve inquiries or service requests regarding McDATA products and services. The Solution Center is staffed 24 hours a day, 7 days a week, including holidays.

NOTE: To expedite warranty entitlement, please have your product serial number available.

McDATA Corporation

11802 Ridge Parkway

Broomfield, CO 80021 US

Phone: (800) 752-4572 or (720) 558-3910

Fax: (720) 558-3860

E-mail: support@mcdata.com

NOTE: Customers who purchased the hardware product from a company other than McDATA should contact that company's service representative for technical support.

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We sincerely appreciate any comments about this publication. Did you find this manual easy or difficult to use? Did it lack necessary information? Were there any errors? Could its organization be improved?

Please send your comments via e-mail, our home page, or FAX. Identify the manual, and provide page numbers and details. Thank you.

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Product laser transceivers are tested and certified in the United States to conform to Title 21 of the Code of Federal Regulations (CFR), Subchapter J, Parts 1040.10 and 1040.11 for Class 1 laser products. Transceivers are tested and certified to be compliant with International Electrotechnical Commission IEC825-1 and European Norm EN60825-1 and EN60825-2 regulations for Class 1 laser products. Class 1 laser products are not considered hazardous. The transceivers are designed to prevent human access to laser radiation above a Class 1 level during normal operation or prescribed maintenance conditions.

Federal Communications Commission (FCC) Statement

Products generate, use, and can radiate radio frequency energy, and if not installed and used in accordance with instructions provided, may cause interference to radio communications. Products are tested and found to comply with the limits for Class A and Class B computing devices pursuant to Subpart B of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference in a residential environment. Any modification or change made to a product without explicit approval from McDATA, by means of a written endorsement or through published literature, invalidates the service contract and voids the warranty agreement with McDATA.

Canadian EMC Statements

The statements below indicate product compliance with Interference Causing Equipment Standard (ICES) and Norme sur le Matériel Brouiller (NMB) electromagnetic compatibility (EMC) requirements as set forth in ICES/NMB-003, Issue 4.

- This Class A or Class B digital apparatus complies with Canadian ICES-003.
- Cet appareil numérique de la classe A et classe B est conforme à la norme NMB-003 du Canada.

United States and Canada UL Certification

The C-UL-US mark on a product indicates compliance with American National Standards Institute (ANSI) and Standards Council of Canada (SCC) safety requirements as tested, evaluated, and certified by Underwriters Laboratories Inc. (UL) and Underwriters Laboratories of Canada (ULC).

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A certification bodies (CB) test report supporting a product indicates safety compliance with the International Electrotechnical Commission (IEC) system for conformity testing and certification of electrical equipment (IECEE) CB scheme. The scheme is a multilateral agreement among participating countries and certification organizations that accepts test reports certifying the safety of electrical and electronic products.

European Union Conformity Declarations and Directives (CE Mark)

The CE mark on a product indicates compliance with the following regulatory requirements as set forth by European Norms (ENs) and relevant international standards for commercial and light industrial information technology equipment (ITE):

- **EN55022: 1998 -** ITE-generic radio frequency interference (RFI) emission standard for domestic, commercial, and light industrial environments, including electrical business equipment.
- **EN55024-1: 1998 -** ITE-generic electromagnetic immunity standard for domestic, commercial, and light industrial environments, including electrical business equipment.
- **EN60950/A11:1997 -** ITE-generic electrical and fire safety standard for domestic, commercial, and light industrial environments, including electrical business equipment.
- **EN61000-3-2:1995 -** ITE-generic harmonic current emissions standard for domestic, commercial, and light industrial environments (equipment with rated current less than or equal to 16 amperes per phase).
- **EN61000-3-3:1995 -** ITE-generic voltage fluctuation and flicker standard (low-voltage power supply systems) for domestic, commercial, and light industrial environments (equipment with rated current less than or equal to 16 amperes per phase).

In addition, the European Union (EU) Council has implemented a series of directives that define product safety standards for member countries. The following directives apply:

- Products conform with all protection requirements of EU directive **89/336/EEC** (Electromagnetic Compatibility Directive) in accordance with the laws of the member countries relating to EMC emissions and immunity.
- Products conform with all protection requirements of EU directive **73/23/EEC** (Low-Voltage Directive) in accordance with the laws of the member countries relating to electrical safety.
- Products conform with all protection requirements of EU directive **93/68/EEC** (Machinery Directive) in accordance with the laws of the member countries relating to safe electrical and mechanical operation of the equipment.

McDATA does not accept responsibility for any failure to satisfy the protection requirements of any of these directives resulting from a non-recommended or non-authorized modification to a product.

European Union EMC and Safety Declaration (N-Mark)

The N-mark on a product indicates compliance with European Union EMC and safety requirements as tested, evaluated, and certified by the Norwegian Board for Testing and Approval of Electrical Equipment (Norges Elektriske Materiellkontroll or NEMKO) laboratory or a NEMKO-authorized laboratory.

Argentina UL Certification

The UL Argentina plus S mark (UL-AR-S mark) on a product indicates compliance with Direccion Nacional de Comercio Interior (DNCI) Resolution Number 92/98, Phase III (for information technology equipment safety). The mark is certified by UL de Argentina, S.R.L., and accredited by the Argentine Accreditation Organization (OAA).

Australia and New Zealand C-Tick Mark

The Australia and New Zealand regulatory compliance mark (C-tick mark) on a product indicates compliance with regulatory requirements for EMC (for information technology equipment) as set forth by the Australian Communications Authority (ACA) and the Radio Spectrum Management Group (RSM) of New Zealand.

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The China Compulsory Certification mark (CCC mark) on a product indicates compliance with People's Republic of China regulatory requirements for safety and EMC (for information technology equipment) as set forth by the National Regulatory Commission for Certification and Accreditation.

Chinese National Standards Statement

The Taiwanese Bureau of Standards, Metrology, and Inspection mark (BSMI mark) and the Chinese National Standards (CNS) statement below indicate product compliance with Taiwanese regulatory requirements. The statement indicates in a domestic environment the product may cause radio interference, in which case the user is required to take corrective actions.

這是乙類的資訊產品，在居住環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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The Voluntary Control Council for Interference (VCCI) statement below applies to information technology equipment, and indicates product compliance with Japanese regulatory requirements. The statement indicates a product is a Class A or Class B product, and in a domestic environment may cause radio interference, in which case the user is required to take corrective actions.

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The Korean Ministry of Information and Communications mark (MIC mark) on a product indicates compliance with regulatory requirements for safety and EMC (for information technology equipment) as authorized and certified by the Korean Radio Research Institute (RRI).

Mexican NOM Mark

The Official Mexican Standard (Normas Oficiales Mexicanas or NOM) mark on a product indicates compliance with regulatory requirements for safety (for information technology equipment) as authorized and accredited by the National System of Accreditation of Testing Laboratories (Sistema Nacional de Acreditamieno de Laboratorios de Pruebas or SINALP).

Russian GOST Certification

The Russian Gosudarstvennyi Standart (GOST) mark on a product indicates compliance with regulatory requirements for safety and EMC (for information technology equipment) as authorized and accredited by the State Committee for Standardization, Metrology and Certification.

South African SABS Certification

The South African Bureau of Standards (SABS) mark on a product indicates compliance with regulatory requirements for safety and EMC (for information technology equipment) as authorized and accredited by the Independent Communications Authority of South Africa (ICASA).

European Union Waste Managment Information

Do not discard this product. European Union Directive 2002/96/EC requires the product to be recycled at the end of its useful life. Follow all waste management actions defined by this directive. Directive requirements may be superseded by EU member nation law. Perform the following to identify pertinent information:

1. Review the original purchase contract to determine a contact regarding waste management of the product, or
2. Contact the company from which the product was procured.

Danger and Attention Statements

The following **DANGER** statements appear in this publication and describe safety practices that must be observed while installing or servicing the product. A **DANGER** statement provides essential information or instructions for which disregard or noncompliance may result in death or severe personal injury.

DANGER statements have a numerical ID (displayed in parentheses) at the end of each statement. Use the numerical ID to locate translated statements in the *McDATA Product Safety Notices* (620-000247).

DANGER

Use the supplied power cords. Ensure the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded. (D004)

DANGER

Disconnect the power cords. (D005)

The following **ATTENTION** statements appear in this publication and describe practices that must be observed while installing or servicing a product. An **ATTENTION** statement provides essential information or instructions for which disregard or noncompliance may result in equipment damage or loss of data.

ATTENTION ! Prior to servicing a product, management server, or customer-supplied server, determine the Ethernet LAN configuration. Installation of products and servers on a public customer intranet can complicate problem determination and fault isolation.

ATTENTION ! Activating a preferred path can result in receipt of out-of-order frames if the preferred path differs from the current path, if input and output (I/O) is active from the source port, and if congestions is present on the current path.

ATTENTION ! Do not remove a power supply unless a replacement FRU is immediately available. To avoid product overheating, a removed power supply must be replaced within five minutes.

ATTENTION ! A reset should only be performed if a CTP card failure is indicated. Do not reset a managed product unless directed to do so by a procedural step or the next level of support.

ATTENTION ! This procedure deletes all data from the C: hard drive partition.

ATTENTION ! Contents of the data directory are backed up to the management server's CD-RW drive when directory contents change. To ensure trouble-free backups, always leave a CD in the drive. Ensure data is not being written to or read from the CD-RW drive before removing the CD. Removing the CD during a backup or restore operation can corrupt data.

General Precautions

When installing or servicing the product, follow these practices:

- Always use correct tools.
- Always use correct replacement parts.
- Keep all paperwork up to date, complete, and accurate.

ESD Precautions

Follow these electrostatic discharge (ESD) procedures:

- If the product is connected to facility power (grounded), wear an ESD wrist strap and grounding cable connected to the product chassis.
- If the product is not connected to facility power (not grounded), wear an ESD wrist strap and grounding cable connected to an approved bench grounding point.
- Touch the product chassis once before performing a procedure, and once each minute during the procedure.
- Store ESD-sensitive FRUs in antistatic packaging.

1 Hardware Installation

This chapter provides instructions for unpacking, inspecting, I/O cable connecting, power cable connecting, and powering on the UltraNet Storage Director - eXtended (USDX) system.

Introduction

The UltraNet Storage Director - eXtended (USDX) platform features a modular design that combines hardware and intelligent software to enable connectivity of legacy and open systems resources across a Wide Area Network (WAN).

The USDX is factory-configured to meet your site's specific hardware and software requirements. All host and network I/O hardware components have been pre-installed, so that external host and network connections are the only hardware requirements. Complete the site preparation procedures as described in the *UltraNet Storage Director - eXtended Site Preparation User Guide* prior to installing the USDX hardware. After hardware installation is complete, use the *UltraNet Storage Director Configuration Wizards User Guide* to make any adjustments to your USDX software configuration.

Unpacking and Inspecting the Hardware

The USDX is packaged on a shipping pallet. Use the following procedure to unpack your hardware:

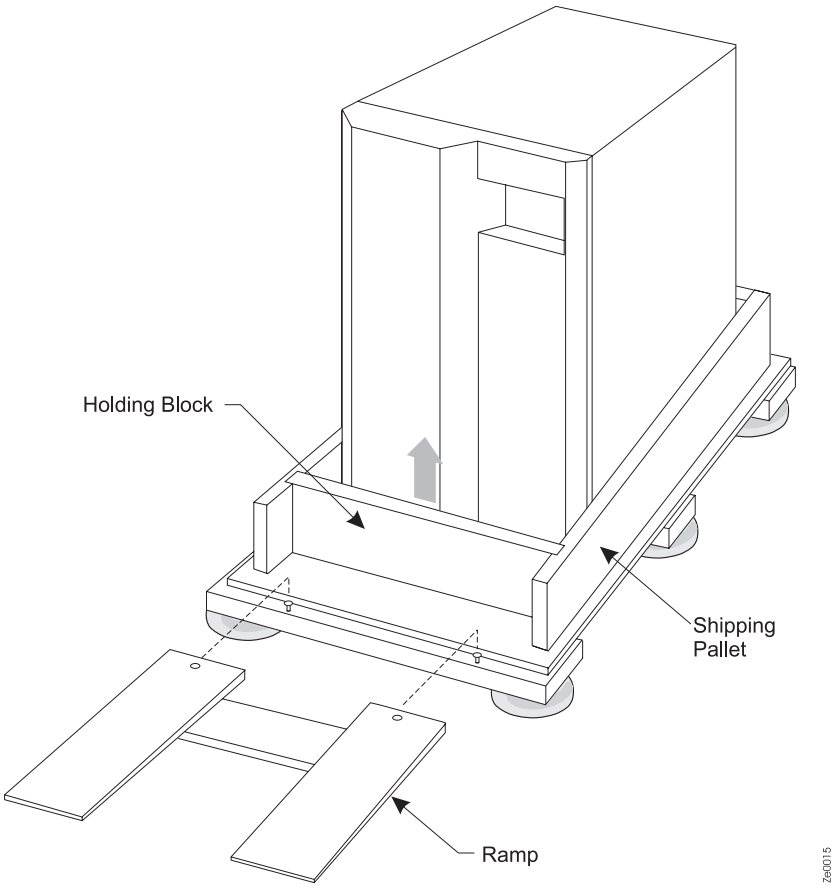
1. Cut and remove the plastic straps holding the cardboard cover in place.

2. Lift the cardboard cover up and off the USDX.
3. Lift the foam packaging up and off the top of the USDX.
4. Remove the plastic wrap around the USDX.
5. For the 9112 USDX, continue at Step 6. For the 9106 USDX, lift the unit off the shipping pallet, then continue with Step 9.

CAUTION

The 9106 system requires that two persons lift it off the pallet; use correct lifting techniques to avoid physical harm.

6. Remove the ramp from the top of the system and place as shown on the next page.



7. Lift the holding block up and away to remove it.
8. Push the USDX onto the ramp and guide it off the pallet.
9. Make sure that you have all the items listed on the packing list(s).

   If any item(s) are missing or broken, please contact your McDATA representative.

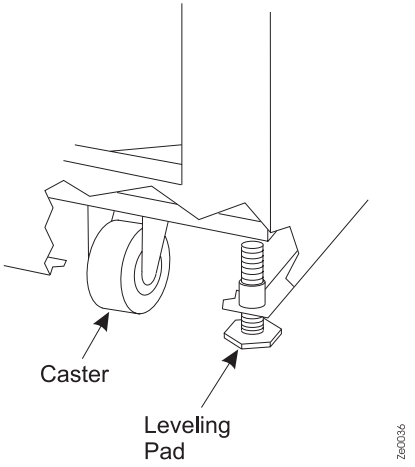
USDX Cabinet Placement

Use the following procedure to place and level the USDX cabinet:

Tools Required: A 7/8-inch open-end wrench.

1. Move the USDX cabinet to the location you identified and prepared during site preparation.

2. Use the 7/8-inch open-end wrench to lower the leveling pads. The leveling pads are located at each bottom corner of the USDX cabinet as shown below.



3. Adjust all leveling pads until the USDX cabinet is off all casters, stable, and is visually level.

Preventing Damage From Electrostatic Discharge (ESD)

Static electricity can damage or degrade electronic components. Therefore, observe the precautions described below when handling USDX hardware.

Grounding Procedure

Before removing any part of the USDX enclosure to expose its circuitry, ensure that you, the equipment rack, and the circuit boards are at ground potential to prevent electrostatic discharge (ESD). Such discharges can damage USDX components. To place yourself at ground potential, plug the USDX in (nearest power outlet) and insert your wrist strap into the wrist strap connector on the USDX chassis (see Figure 1-1).

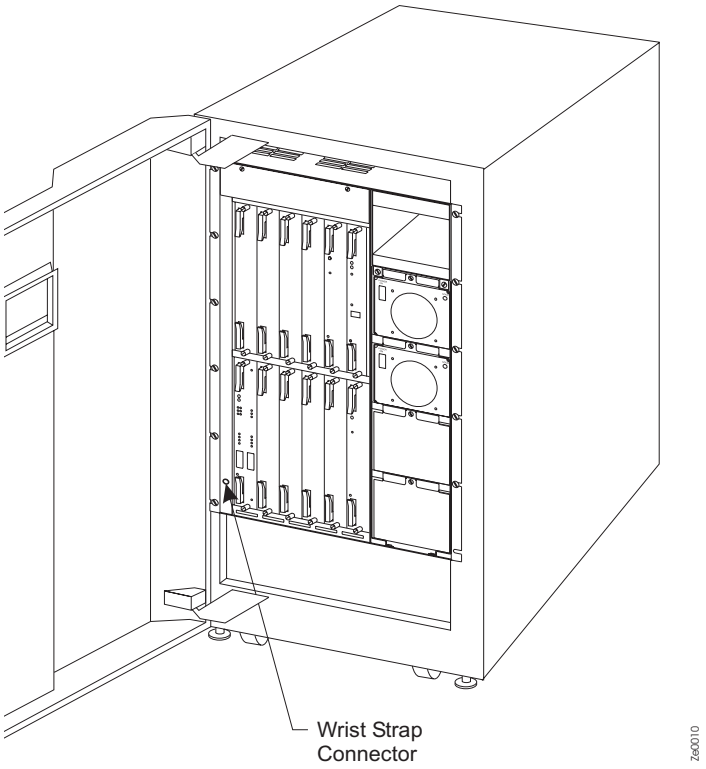


Figure 1-1 F9112 Wrist Strap Connector

The following reminders help prevent ESD damage to the USDX:

- Wear an electrostatic dissipative lab coat, fully snapped.
- Always use an ESD wrist strap with proper grounding connections. See Figure 1-1 for the location of the wrist strap connectors.
- Conserve movement. Movement can cause a build-up of static electricity.
- Handle the USDX and its components carefully. Never touch the circuitry. Place your hands only on the edges, rails, or frame of the unit.

- Place and work on the USDX in an ESD-aware area only.
- Touch a spare component—while it is still in the anti-static wrapping—to an unpainted metal portion of the USDX for at least two seconds. This allows the static electricity to discharge harmlessly from your body and the spare.
- Install the spare directly into the USDX after removing it from the anti-static wrapping. Do not remove the anti-static wrapping until you are ready to do the install. If you must set down an unwrapped spare, set it down on a static mat or on its anti-static wrapping.

ATTENTION! Do not place the spare component on top of the USDX or on a metal table. Either action could cause severe damage to the spare.

- Set down adapters with their component sides face up.
- Be aware of weather conditions. Cold weather increases the likelihood of static electricity build-up.
- Be aware of your own conductivity level. Some people are more likely than others to build up static electricity. Products, such as Static Guard and other static sprays available at office or computer supply stores, can be used to diminish personal static electricity build-up.

Card Protection

Each spare card is shipped in a separate, reusable, and anti-static shielding bag. Leave each card in its bag until the card is installed in the machine. Do not remove a card from its bag unless you are grounded. Do not place a bag on exposed electrical contacts where it can cause short circuits.

Cables and Equipment

The following sections list the cables, adapters, and other equipment required for the USDX.

McDATA-Supplied Cables and Equipment

Table 1-1 lists the cables and equipment that McDATA supplies with each USDX.

Table 1-1 McDATA Supplied Cables and Equipment

Type	Description
RJ-45 Cabling	McDATA supplies the RJ-45 cabling used to connect the HMB3 board to the Primary Service Monitor and Secondary Service Monitor if one is installed.
SCSI Cable	SCSI cable used for the connection from the SCSI-SE port on the USM I/O adapter to the SCSI terminator on the back of the USDX chassis. The end of the cable that attaches to the USM I/O has a 68-pin connector and the end of the cable that attaches to the back of the USDX chassis has a 50-pin connector.
Ethernet Drop Cable	Each Primary Service Monitor (SBus I/O adapter) card must have an Ethernet drop cable. This is a 5-foot DB-15 to Ethernet AUI connector cable. The Primary Service Monitor is a 10 BaseT only Ethernet. Also, each Ethernet 10/100 I/O port ships with an Ethernet drop cable. This Ethernet drop cable contains a low profile connector on one end and a RJ-45 jack on the other.
Power Plug	Refer to the section “Power Cord Requirements” to determine the appropriate receptacle/power cord.
Modem	Either a Microcom or a Multi-Tech modem is required as part of the remote support configuration.
AA adapter	This Data Bus (DB) adapter inserts into the DTE port on the back of the remote modem for direct connection to the USDX. Note: If a remote modem is being used 1 AA adapter is needed. See Appendix D for information on DB adapters available from McDATA.
DD Adapter	This Data Bus (DB) adapter inserts into the back of the PC for connection to the Hardware Monitor Board. See Appendix D for information on DB adapters available from McDATA.
H adapter	This DB adapter inserts into the DTE port on the modem. It is used to connect the modem to the Hardware Monitor Board. Note: The adapter is also needed for the SPARC workstation, if you are using a 25-pin serial interface on your workstation as an H adapter. Refer to Appendix D for information on the DB adapters available from McDATA.

Customer-Supplied Cables and Equipment

The specific host and network cables for the external cable connections must be supplied by the customer. Table 1-2 lists the hardware specifications for the customer-supplied equipment.

NOTE: Your installation may not require all the equipment listed below, as it is site-specific.

Table 1-2 Customer-Supplied Cables and Equipment Specifications

Cable and Equipment	Description
Power Receptacles	See the "Power Cord Requirements" section to determine the appropriate receptacle/power cord.
Outside Analog Telephone	An external analog RJ-11 plug type telephone line is required for McDATA Customer Support Services access.
ESCON Cables	This is from the standard IBM ESCON cable specifications.
Ethernet Transceiver	Attachment Unit Interface (AUI) connection DB-15 pin transceiver connector to customer dependent connection.
ATM (OC-3) ATM/POS (OC-12) Fibre Channel FICON T3 Ethernet 10/100 Gigabit Ethernet	The customer should ensure conformance to the specifications provided in the "Cable and Connector Specifications" section of the *UltraNet Storage Director - eXtended Site Preparation User Guide*.

Power Cord Requirements

The USDX requires one 15 amp outlet for each power supply installed in the system. The maximum number of power supplies per F9112 system is 4. The maximum number of power supplies per F9106 is 2.

NOTE: In addition to the above power requirements, 2 or more power outlets are required for peripheral equipment including the PC and the modem.

Domestic and International

Table 1-3 Domestic Power Plug Options

Type	Description
Standard	One 6 ft. power cord with a 5-15P plug that is compatible with the IEC 320 C-14 receptacle is shipped for each power supply.
Optional 110 AC Distribution (Domestic)	A 7.5 (2.3 meters) cord with a L5-30P (twist lock) plug is shipped with each optional 110 VAC distribution panel.

Table 1-4 International Power Plug Options

Type	Description
Standard	The customer supplies a cord that is compatible with the IEC 320 C-14 receptacle. One cord is required for each power supply.
Optional 220 AC Distribution (European)	The customer supplies a cord that is compatible with the IEC 320 C-19 receptacle. One cord is required for each USDX.

Connecting the USDX

The following section describes the procedures for connecting your network cables to the USDX. These connections are made by attaching cables to the appropriate ports on the circuit boards.

Connecting the Cables

Once your USDX is unpacked and in location, the I/O connections should be made. Use the following procedures to connect your cables to the USDX, then use the "Cable Routing" section that follows to route the cables within the cabinet. Procedures for cabling the following are provided:

NOTE: The cabling procedures for the WTI and Penril switches are provided in Appendix C, WTI and Penril Switch Support. This appendix applies only to UltraNet Storage Director - eXtended systems that have a WTI/Penril switch installed.

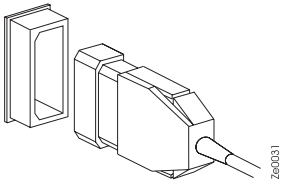
- ESCON

- ATM (OC-3)
- ATM/POS (OC-12)
- Fibre Channel
- FICON Single-Mode and Multi-Mode
- T3
- Ethernet 10/100
- Gigabit Ethernet
- Service Monitor SCSI Cabling for the USM I/O and SBus I/O adapters.
- Hardware Monitor Board cabling procedures for:
  - — Primary Service Monitor (USM I/O adapter and SBus I/O adapter)
  - — Secondary Service Monitor (USM I/O adapter and SBus I/O adapter)
  - — Modem

ESCON Cabling

1. Locate the IBM ESCON channel cable jack on the ZENx (ESCON) adapter installed in the front of the USDX.

   Note: The location of your ZENx circuit card is site specific.



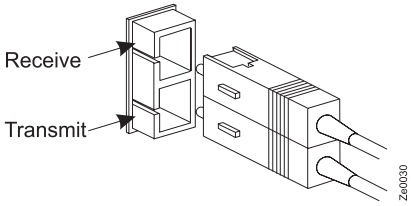
2. Locate the ESCON channel cable and connector.
3. Align the cable connector with the IBM channel jack. Gently press the connectors into place.

ATM (OC-3) Cabling

The following sections provide the procedures for the different cabling connector types.

SC Cabling

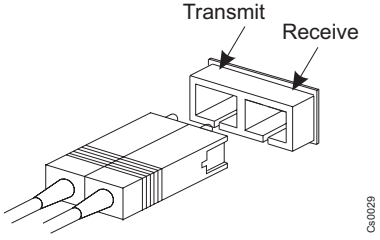
1. Locate ZAP5 (see Table 2-10) port configured as ATM.
2. Locate the ATM(OC-3) fiber cable with the standard SC connector.



3. Align the cable connectors Rx and Tx with the ATM port Rx and Tx. Gently press the connectors into place.

LC Cabling

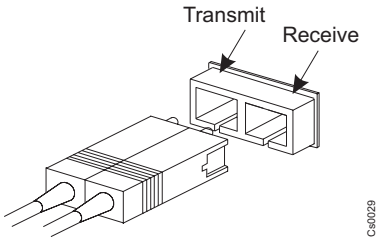
1. Locate the ZAP5 (see Table 2-10), or SBus I/O (see Table 2-8) port configured as ATM.
2. Locate the ATM(OC-3) fiber cable with the standard Duplex LC connector.



3. Align the cable connectors Rx and Tx with the ATM port Rx and Tx. Gently press the connectors into place.

ATM/POS (OC-12) Cabling

1. Locate the ZAP5 (see Table 2-10) I/O port configured as ATM (OC-12).
2. Locate the ATM (OC-12) fiber cable with the standard Duplex LC connector.



3. Align the cable connectors Receive (Rx) and Transmit (Tx) with the ATM (OC-12) port Rx and Tx. Gently squeeze the locking clips and press the connectors into place.

Fibre Channel Cabling

If you have chosen to use Fibre Channel (FC) for your PCI_0 or PCI_1 option, there are certain topology and cabling issues you need to be aware of.

Topology Issues

Table 1-5 provides cable type and distance information.

Table 1-5 Fiber Type and Distance Restrictions

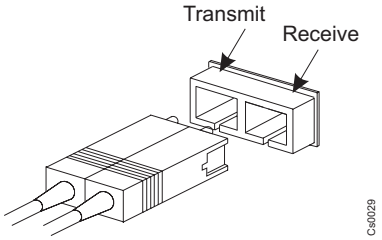
Type Laser	Effective Rate Mbps	Distance Kilometers	Baud Rate Mbaud
62.5-Micron Multimode Fiber			
Shortwave	100	up to 0.175	1062.5
Shortwave	25	up to 0.7	265.6
Longwave LED	25	up to 1.5	265.6

Cabling Issues

The Fibre Channel cable uses either an LC connector, SC connector, or DB-9 connector. Use the appropriate section below depending upon your cable type and the card to which you are connecting the cable.

LC Fibre Channel Cabling

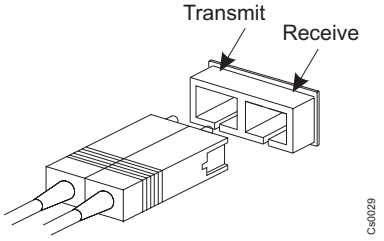
1. Locate the ZAP5 I/O port configured as Fibre Channel.
2. Locate the Fibre Channel fiber cable with the duplex LC connector.



3. Align the cable connectors Rx and Tx with the Fibre Channel port Rx and Tx. Gently press the connectors into place.

FICON Single-Mode Cabling

1. Locate the port configured as Single-Mode FICON.
2. Locate the Single-Mode FICON cable with the standard Duplex LC connector.

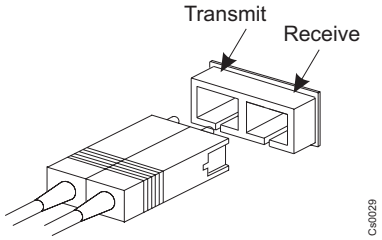


3. Align the cable connectors Receive (Rx) and Transmit (Tx) with the Single-Mode FICON port Rx and Tx. Gently squeeze the locking clips and press the connectors into place.

FICON Multi-Mode Cabling

1. Locate the port configured as Multi-Mode FICON.

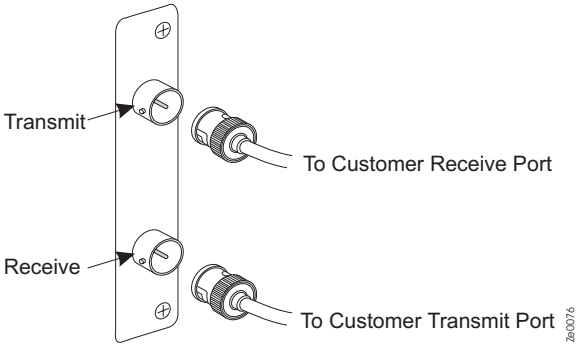
2. Locate the Multi-Mode FICON cable with the standard Duplex LC connector.



3. Align the cable connectors Receive (Rx) and Transmit (Tx) with the Multi-Mode FICON port Rx and Tx. Gently squeeze the locking clips and press the connectors into place.

T3 Cabling

1. Locate the ZAP5 (see Table 2-10) I/O ports configured as T3.
2. Locate the T3 cables with the BNC connectors.

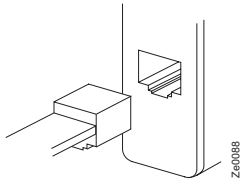


3. Align the BNC transmit cable connector to the T3 transmit port connector. Gently twist the BNC connector clockwise until it locks into place.
4. Align the BNC receive cable connector to the T3 receive port connector. Gently twist the BNC connector clockwise until it locks into place.

Ethernet 10/100 Cabling

1. Locate the ZAP5 I/O 10/100 Ethernet port (above port PCI I/O B). See Table 2-10 for the ZAP5 I/O port locations.

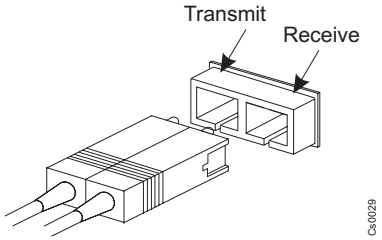
2. Locate the Ethernet cable with the RJ-45 connector.



3. Align the RJ-45 cable connector with the RJ-45 jack on the Ethernet card. Gently insert the connector.

Gigabit Ethernet Cabling

1. Locate the ZAP5 I/O port configured as Gigabit Ethernet. See Table 2-10 for location.
2. Locate the Gigabit Ethernet cable with the standard LC connector.



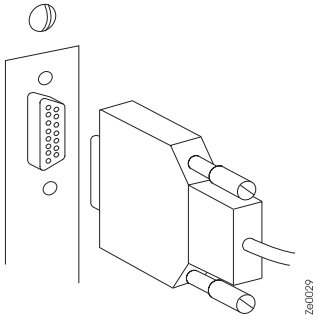
3. Align the cable connectors Receive (Rx) and Transmit (Tx) with the Gigabit Ethernet port Rx and Tx. Gently press the connectors into place.

Service Monitor Ethernet Cabling for the SBus I/O Adapter

Use the following procedure to connect the Ethernet cabling on the SBus I/O (ZSIO) adapter:

1. Locate the Ethernet cable connection on the Service Monitor(s) SBus I/O card installed in the back of the USD.
2. Connect the Ethernet drop cable's microminiature D-sub connector to the SBus I/O Ethernet port using a small straight slot screwdriver.

   Note: To avoid damaging the pins, do not force the connector into the jack.



3. Connect the other end of the cable (an AUI connector) to your Ethernet network (i.e., a transceiver which converts the AUI interface to a compatible interface for your site, usually a RJ-45 connection). The AUI connector is a slide clip.

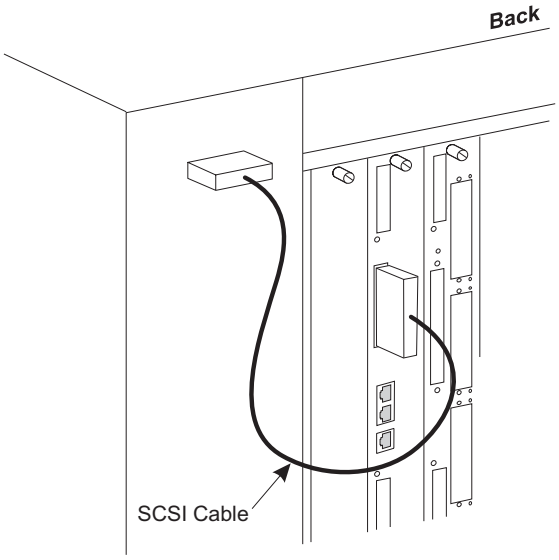
Service Monitor SCSI Cabling

The following sections provide the SCSI cabling procedures for the UltraNet Service Monitor I/O (USMIO) adapter and the SBus I/O (ZSIO) adapter. Use the procedure that corresponds to your Service Monitor type.

For the UltraNet Service Monitor I/O (USMIO) Adapter

Use the following procedure to connect the Service Monitor SCSI cabling:

1. Locate the SCSI connector on the Primary Service Monitor's USM I/O card installed in the back of the USDX.
2. Align the SCSI cable's 68-pin connector with the SCSI-SE port on the USM I/O card. Gently press the connector into place.

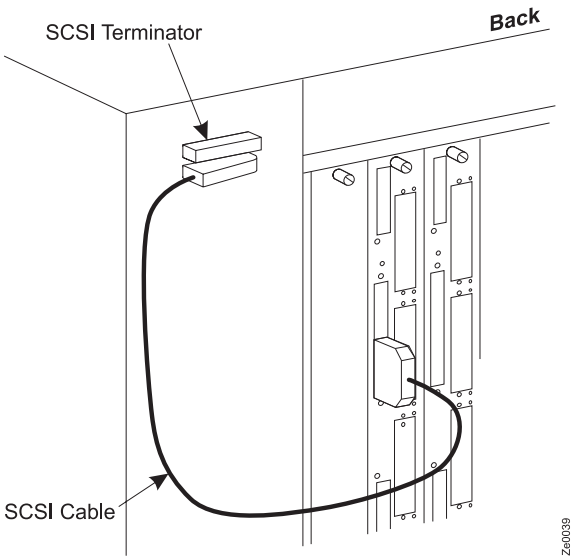


3. Locate the SCSI connector on the upper left corner of the USDX chassis, as shown in the figure above.
4. Align the SCSI cable's 50-pin connector with the SCSI connector on the chassis. Gently press the connector into place.

For the SBus I/O (ZSIO) Adapter

Use the following procedure to connect the SCSI Narrow cabling for the SBus I/O adapter:

1. Locate the SCSI connector on the Primary Service Monitor's SBus I/O card installed in the back of the USD.
2. Align the SCSI cable connector to the SBus I/O card SCSI connector. Gently press the connector into place.



3. Locate the SCSI connector on the auxiliary disk tray located on the back of the USD.
4. Align the SCSI cable connector to the auxiliary disk tray SCSI connector. Gently press the connector into place.
5. Connect a SCSI terminator to the other auxiliary disk tray connection.

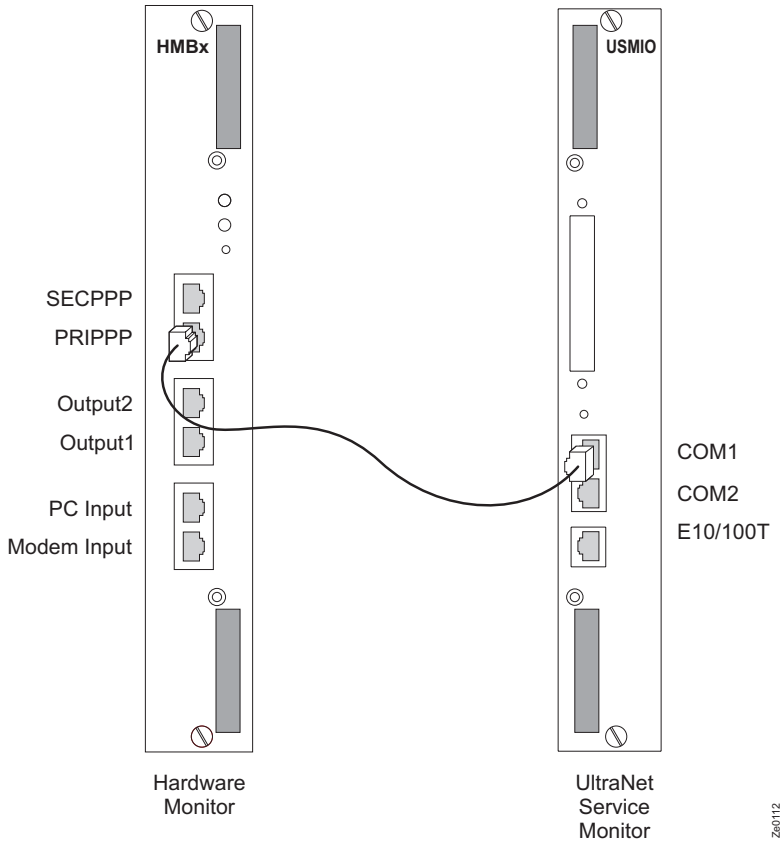
Hardware Monitor Board Cabling

The following sections provide the procedures to connect the RJ-45 cabling from the Hardware Monitor Board (HMB3) to the Primary Service Monitor, Secondary Service Monitor, modem, and PC. The Hardware Monitor Board is located in the back of the USD.

Connecting to the Primary Service Monitor (USMIO)

Use the following procedure to connect the Hardware Monitor Board cable to the Primary Service Monitor:

1. Locate the connection cable (P/N 21500176) for the Hardware Monitor Board.
2. Connect one end of the cable to the PRIPPP port on the Hardware Monitor Board and connect the other end of the cable (which has the USM label closest to it) to the COM1 port on the Primary Service Monitor (USM I/O adapter), as shown in the figure below.

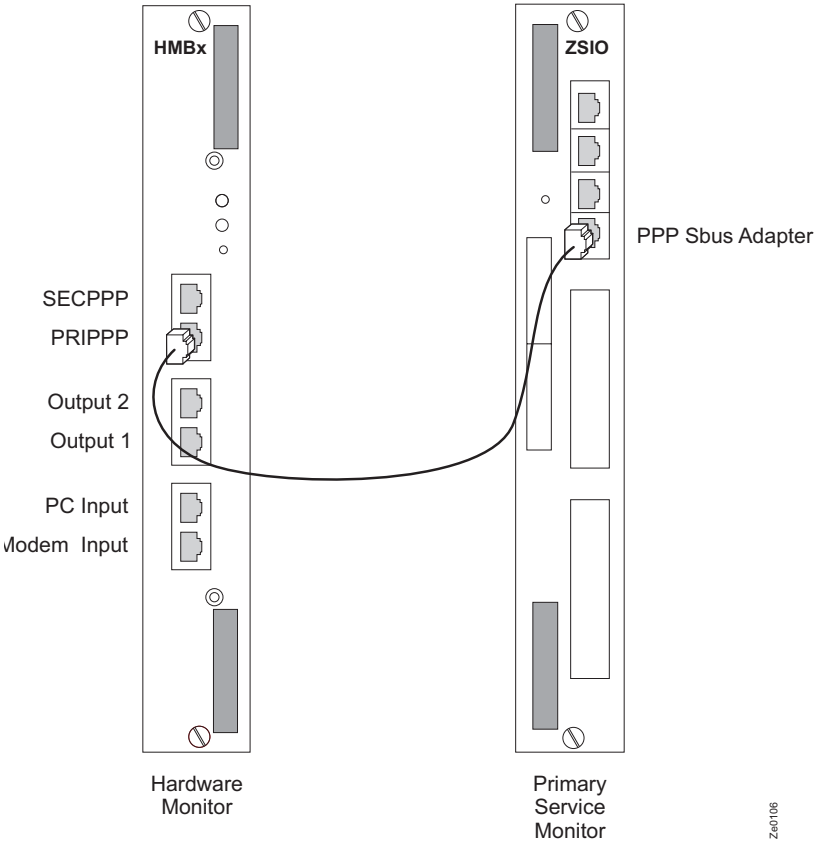


Connecting to the Primary Service Monitor (ZSIO)

Use the following procedure to connect the Hardware Monitor Board to the Primary Service Monitor:

1. Locate the connection cable (P/N 21500167) for the Hardware Monitor Board.
2. Connect one end of the cable to the PRIPPP port on the Hardware Monitor Board and connect the other end of the cable (which has the cosystem label closet to it), to the PPP SBus Adapter on interface 1 of the Primary Service Monitor (ZSIO), as shown in the figure below.

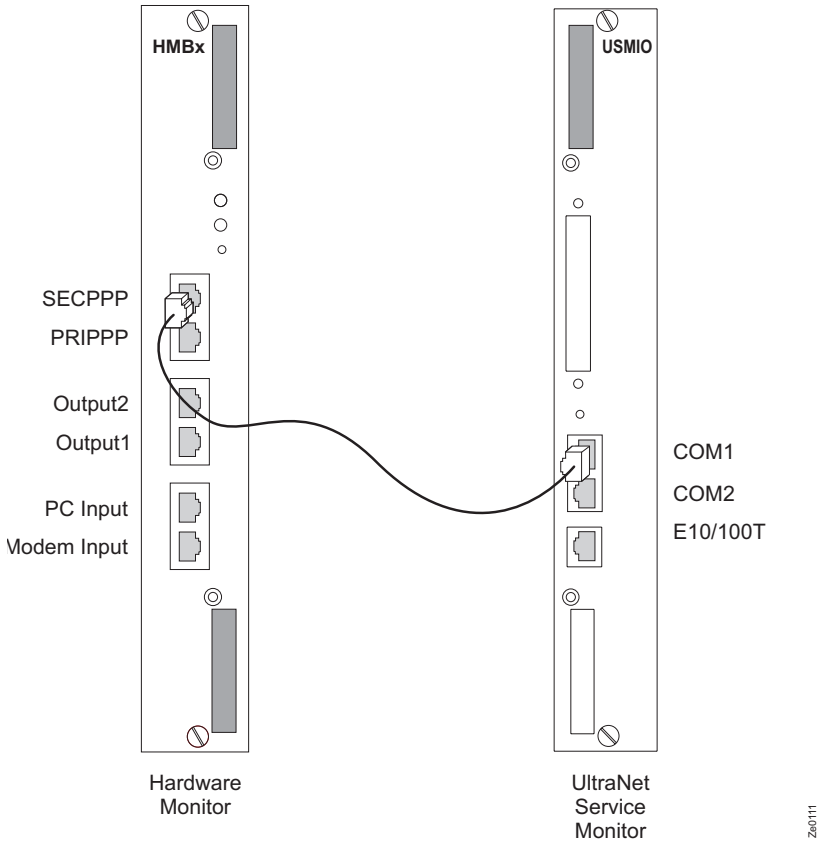
NOTE: The four ports on interface 1 of the SBus I/O adapter (ZSIO) are all functional ports.



Connecting to the Secondary Service Monitor (USMIO)

Use the following procedure to connect the Hardware Monitor Board cable to the Secondary Service Monitor:

1. Locate the connector cable (P/N 21500176) for the Hardware Monitor Board.
2. Connect one end of the cable to the SECPPP port on the Hardware Monitor Board and connect the other end of the cable (which has the USM label closest to it) to the COM1 port on the Secondary Service Monitor (USM I/O adapter), as shown in the figure below.

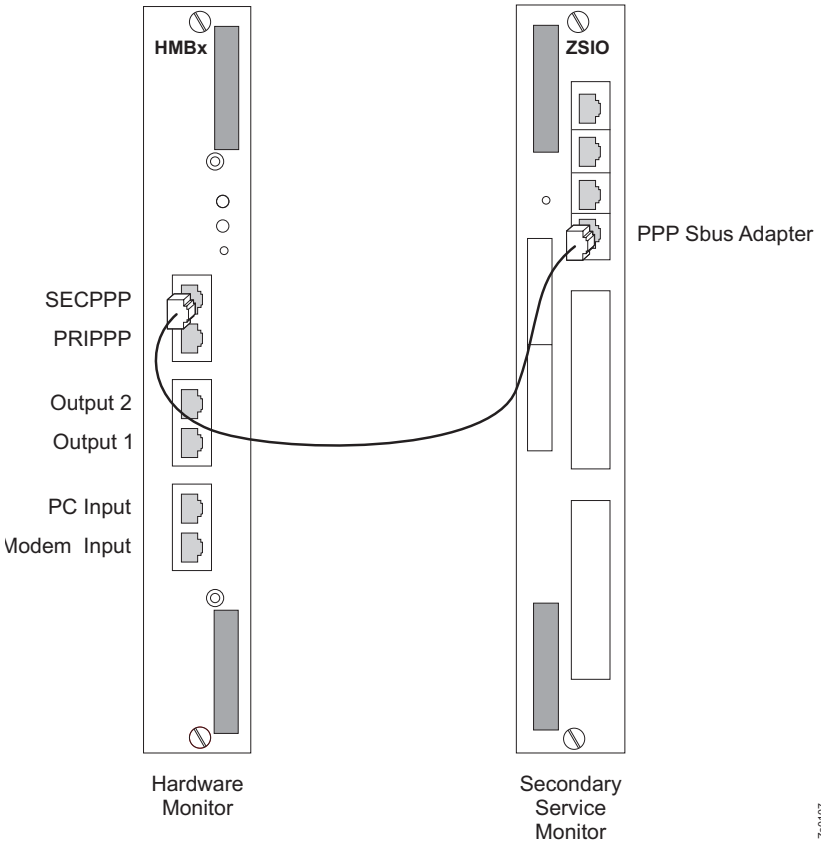


Connecting to the Secondary Service Monitor (ZSIO)

Use the following procedure to connect the Hardware Monitor Board to the Secondary Service Monitor:

1. Locate the connector cable (P/N 21500167) for the Hardware Monitor Board.
2. Connect one end of the cable to the SECPPP port on the Hardware Monitor Board and connect the other end of the cable (which has the cosystem label closest to it), to the PPP SBus Adapter on interface 1 of the Secondary Service Monitor (ZSIO), as shown in the figure below.

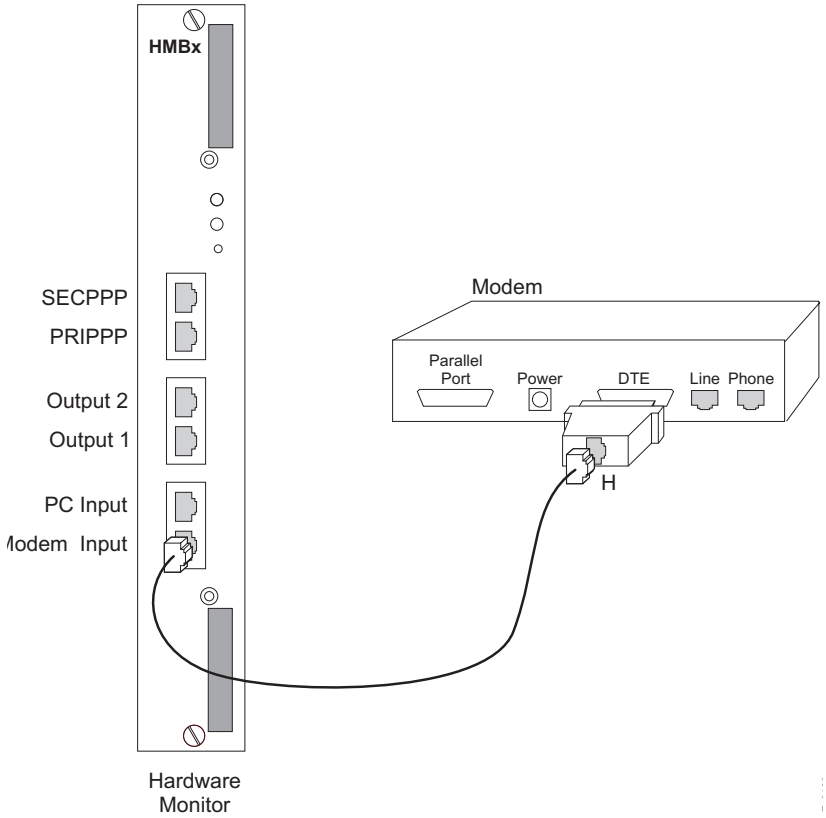
   Note: The four ports on interface 1 of the SBus I/O adapter (ZSIO) are all functional ports.


HMBx
ZSIO
PPP Sbus Adapter
SECPPP
PRIPPP
Output 2
Output 1
PC Input
Modem Input
Hardware Monitor
Secondary Service Monitor

Connecting to the Modem

Use the following procedure to connect the modem to the Hardware Monitor Board:

1. Insert an H adapter into the DTE port on the back of the modem.
2. Insert one end of the RJ-45 cable into the H adapter on the modem and the other end of the cable into the MODEM INPUT port on the Hardware Monitor Board.



3. Connect the external phone line to the modem.

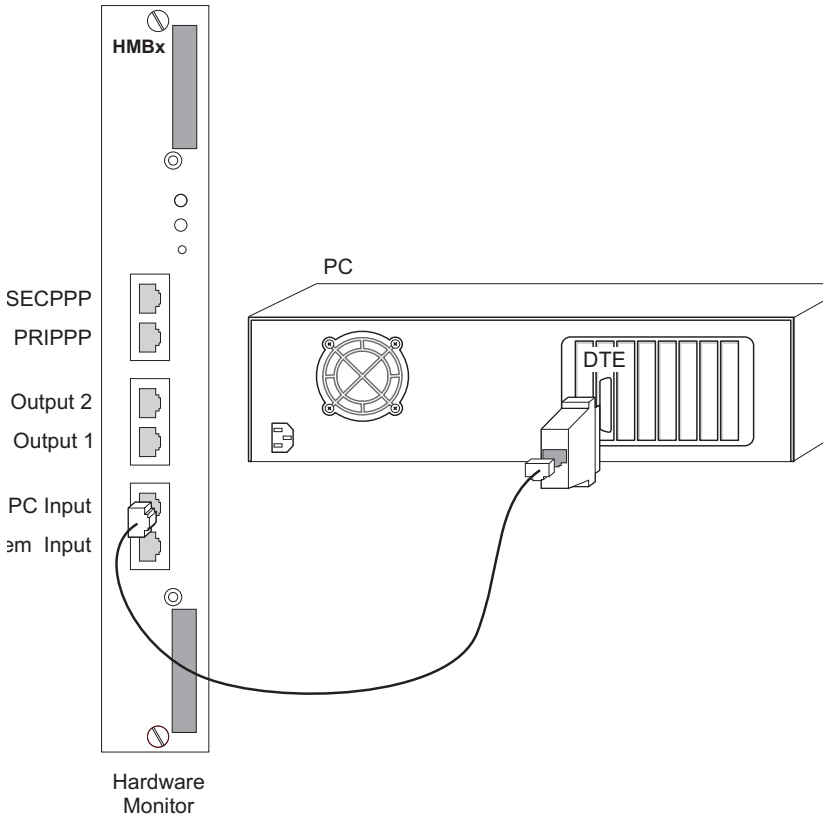
Caution: When using the modem, follow your site's security procedures to protect access to your network.

NOTE: If you are using a Microcom modem, note that the battery lasts for 30 days without AC applied. If the battery completely discharges, the modem's factory settings change to the default settings. Refer to Appendix B for the proper modem settings.

Connecting the Hardware Monitor Board to a PC

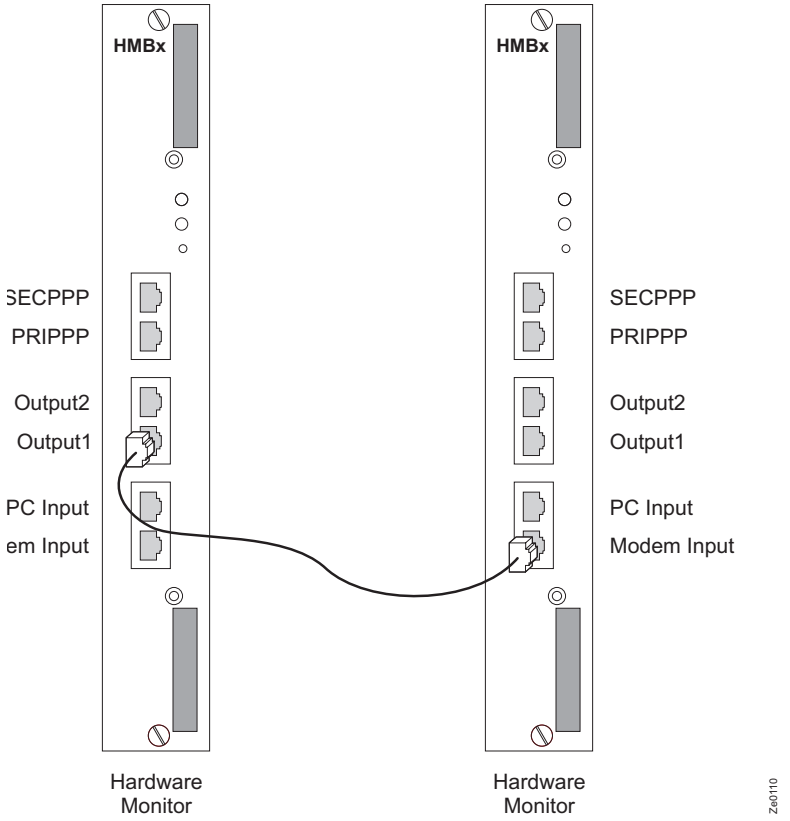
Use the following procedure to connect the Hardware Monitor Board to the PC:

1. Connect the Hardware Monitor Board to the PC by inserting a DD adapter into the DB-9 serial connector on the back of your PC. If your PC has a DB-25 connector, you will need a 9-pin to 25-pin converter.
2. Insert one end of the RJ-45 cable into the DD adapter and the other end of the cable into the PC INPUT port on the Hardware Monitor Board.



Daisy Chaining the Hardware Monitor Board

You can daisy chain two Hardware Monitor Boards using a RS-232 straight through cable with RJ-45 connections. To do this connect one end of the cable to the OUTPUT 1 port on the first Hardware Monitor Board and connect the other end of the cable to the MODEM INPUT port on the second Hardware Monitor Board, as demonstrated in the figure below.



Cable Routing

Route the cables within the USDX to allow access to the circuit cards. For cable connections on the back of the USDX in slots 1-6, route the cables over and around the side rail (see Figure 0-1). For cable connections on the back of the USDX in slots 7-12, route the cables down and out the bottom. For all cable connections to the front of the USDX route the cables down and out the bottom.

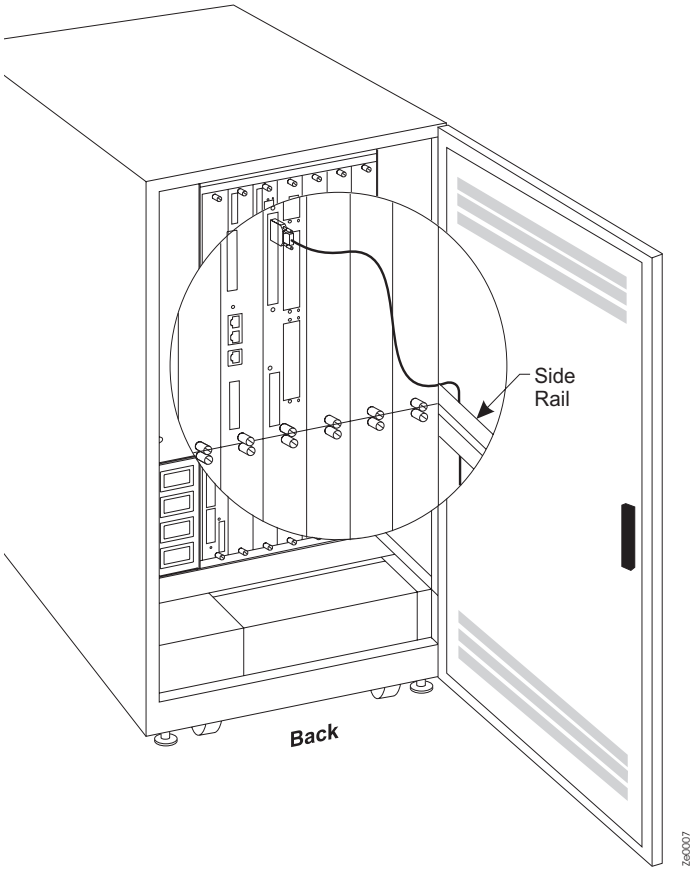


Figure 0-1 Cable Routing within the USDX Cabinet

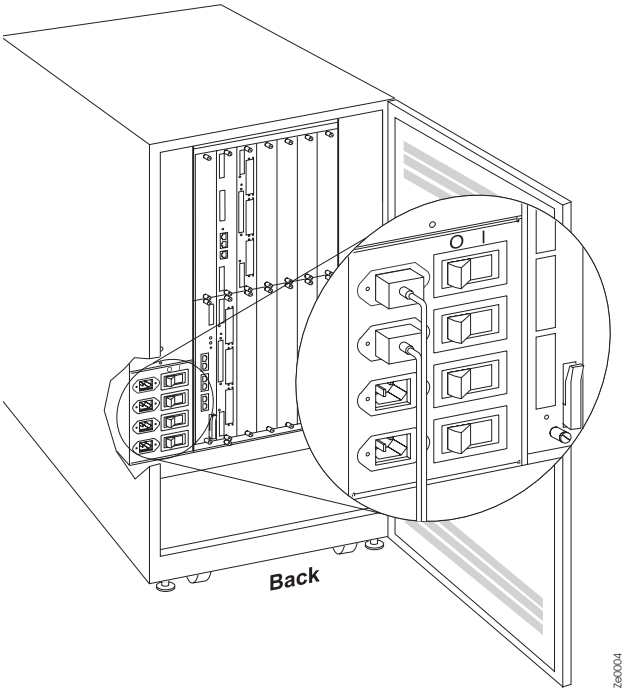
Powering-On the USDX

A power cord for the USDX is provided only for North American customers. Use the following procedure to power-on the USDX:

1. Connect the external power cord to the site-configured power.
2. Set the 4 switches in the lower left back of the USDX to ON (as shown in the illustration below). Each cord connects to one Power Supply.
3. Push the Power switch which is located on the power supply on the front of the USDX to ON.

NOTE: The GOOD indicator on the power supply and the POWER indicator on the front chassis are lit when the circuit is complete. Also, if the system requires more than 1 power supply, the GOOD light does not come on until the second or third supply is powered on.

4. Repeat Step 3 for each additional power supply installed.



2

Switches and Indicators

This chapter contains descriptions of the function and normal operating status for switches and indicators on the F9112 and F9106 USD-X cabinet and on the circuit boards. The information in this chapter is for operation reference and on-site problem isolation after the network is implemented.

USD-X 9112 Cabinet Layout

The USD-X 9112 cabinet contains slots for inserting circuit boards that connect to a midplane in the USD-X cabinet. The front and back of the USD-X cabinet each have 12 slots available for circuit boards. Figure 2-1 shows the numbering for these slots.

There are two additional slots on the back of the USD-X cabinet (*see* Figure 2-1). These two slots are not numbered; one slot always contains a Hardware Monitor Board and the other slot is reserved.

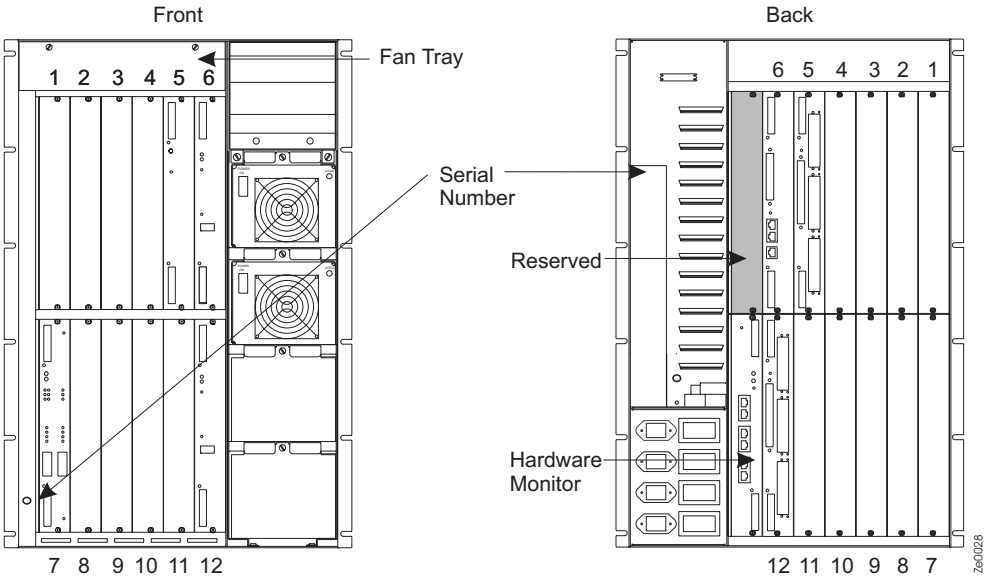


Figure 2-1 F9112 Cabinet Slot Numbering

The USD-X cabinet contains a fan tray, a SCSI drive assembly, and power supply(s) (*see* Figure 2-2). The fan tray contains six fans and is located above the circuit cards. The SCSI drive assembly can be configured for up to two shared SCSI devices with any combination of the following:

- a hard disk drive
- a DAT drive or CD-RW drive

NOTE: USD-X which have a ZSP Application Processor installed use a DAT drive for backups and restores. USD-X chassis which have a UltraNet Service Monitor (USM) installed use a CD-RW drive for backups and restores.

The number of power supplies depends on the system configuration.

Figure 2-2 shows a sample configuration that has two power supplies.

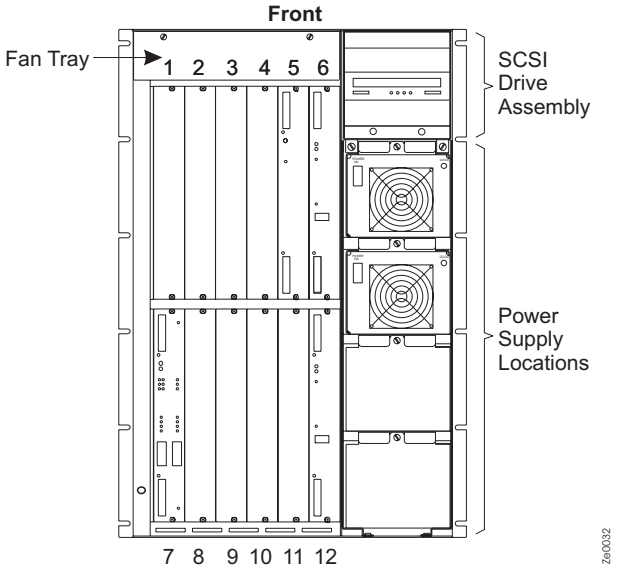


Figure 2-2 F9112 Cabinet Front Layout

NOTE: For installation and removal procedures of the above components, *see* Chapter 3.

USD-X 9106 Cabinet Layout

The USD-X 9106 cabinet contains slots for inserting circuit boards that connect to a midplane in the USD-X cabinet. The front and back of the USD-X cabinet each have 6 slots available for circuit boards. Figure 2-3 shows the numbering for these slots.

There is an additional slot on the back of the USD-X 9106 cabinet (*see* Figure 2-3). This slot is not numbered and contains a Hardware Monitor Board.

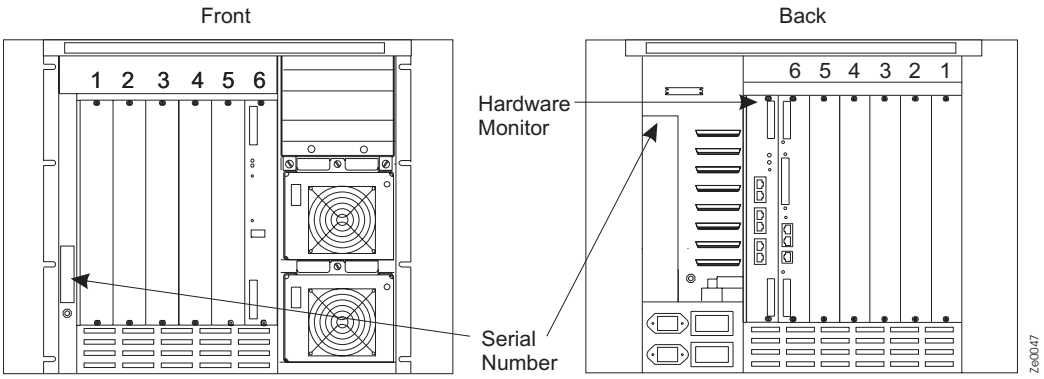


Figure 2-3 F9106 Cabinet Slot Numbering

The USD-X 9106 cabinet also contains a fan tray, a SCSI drive assembly, and power supply(s) (see Figure 2-4). The fan tray contains six fans and is located above the circuit cards. The SCSI drive assembly can be configured for up to two shared SCSI devices with any combination of the following:

- a hard disk drive
- a DAT drive or CD-RW drive

NOTE: USD-X which have a ZSP Application Processor installed use a DAT drive for backups and restores. USD-X chassis which have a UltraNet Service Monitor (USM) installed use a CD-RW drive for backups and restores.

The 9106 cabinet can be configured for one or two power supplies depending upon system configuration. Figure 2-4 shows a sample configuration with two power supplies.

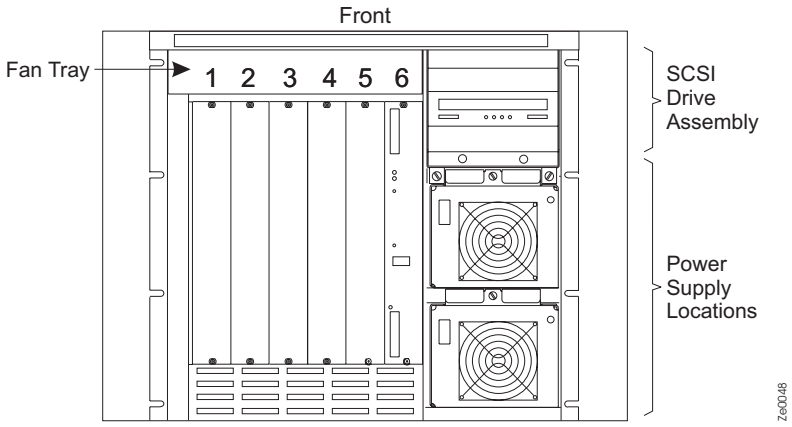


Figure 2-4 F9106 Cabinet Front Layout

NOTE: For installation and removal procedures of the above components, *see* Chapter 3.

Front of Cabinet

The switches and indicators on the front of the USD-X are on the disk drive bay and each power supply (see Figure 2-5). Table 2-1 provides a description of each switch and indicator located on the front of the USD-X.

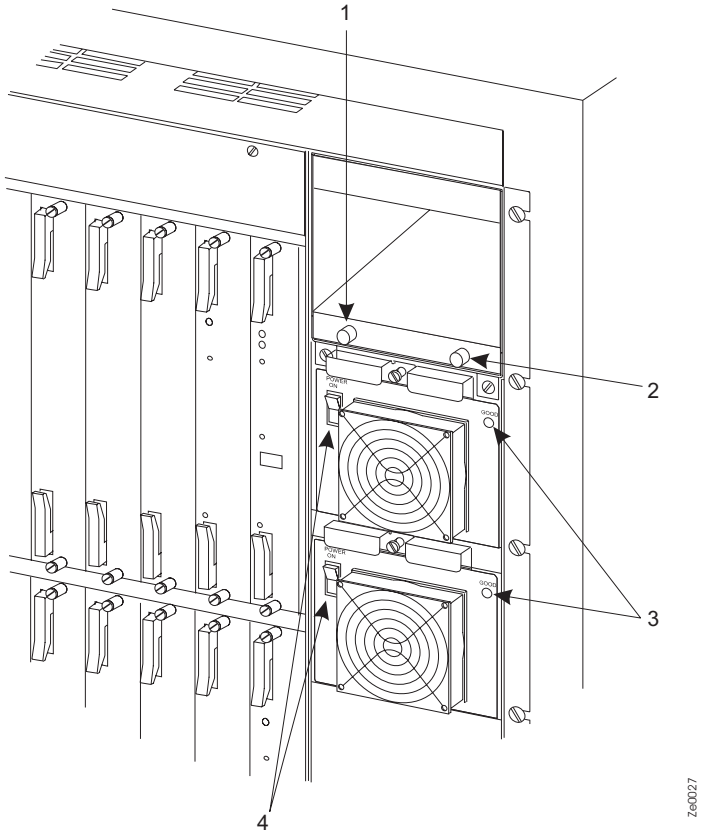


Figure 2-5 Switches and Indicators on Front of Cabinet

Table 2-1 Switches and Indicators on Front of Cabinet

Index	Switch/Indicator	Function	Normal Operation
1	Green LED	When lit, indicates power to the system is on.	On
2	Amber LED (Service LED)	When lit, indicates service is required.	Off

Table 2-1 Switches and Indicators on Front of Cabinet

Index	Switch/Indicator	Function	Normal Operation
3	Green LED, for power supply	When lit, indicates normal operation.	On
4	Power Switch	Used to turn power supply on or off.	On

Back of Cabinet

On the back of the USD-X cabinet there are four switches located on the lower left (*see* Figure 2-6).

NOTE: To turn on system power, set all the switches (4 on the 9112 and 2 on the 9106) to the on (1) position. Then set the Power switch (located on the front of the cabinet) to the on position (*see* Figure 2-5).

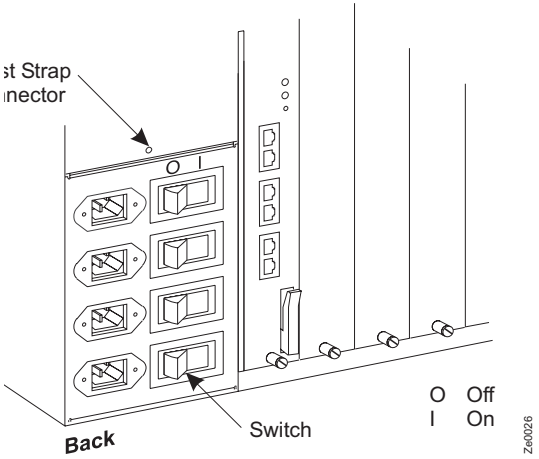


Figure 2-6 Switches on Back of Cabinet

Circuit Boards

This section describes the switches and indicators for the various circuit boards available for the USD-X. Each circuit board type is represented by an illustration in a table that describes the switches and indicators. The following is a list of the circuit boards described in this section:

- The Hardware Monitor Board (HMBx) monitors environmental conditions, hardware status, and issues hardware alerts to the Service Monitor. The Hardware Monitor Board (HMB3) replaces the Hardware Monitor Adapter (HMAx), which required a WTI/Penril switch for connection to the Primary and Secondary Service Monitor.
- The Hardware Monitor Adapter (HMAx) is used in conjunction with a WTI/Penril switch to connect to the Primary and Secondary Service Monitors, PC, and modem. Information on connecting the Hardware Monitor Adapter to the WTI/Penril switch can be found in Appendix C, WTI and Penril Switch Support on page C-2.
- UltraNet Service Monitor (USM) Application Processor card is a functional replacement for the ZSP (SPARC Service Monitor). The USM is the result of merging Sun Microsystem's CP1400 and McDATA's UAN boards into one board. The USM card always has a corresponding USM I/O card for I/O connections. The USM Application Processor uses a CD-RW drive for backups and restores. The ZSP (SPARC Service Monitor) uses a DAT drive for backups and restores.
- USM I/O (USMIO) provides the I/O connections for the USM board. The USM I/O card installs in the back of the USD and requires an UltraNet Service Monitor (USM) to be installed in the associated front slot. The USM I/O is a functional replacement for the SBus I/O card.
- ZSP is an application processor adapter based on the SPARC instruction set architecture originally designed by Sun Microsystems. The ZSP card always has a corresponding SBus I/O card for I/O connections. For additional information on the application processor refer to the "Application Processor Overview" in Chapter 3.

- SBus I/O (ZSIO) provides the I/O connection for the ZSP application processor card. The SBus I/O card installs into the back of the USD and requires a SPARC (ZSP) application processor adapter to be installed in the associated front slot.
- ESCON (ZENx) contains several Motorola processors to run the required driver code. ESCON stands for Enterprise Systems Connection and is part of IBM's ESA/390 architecture. The ESCON interface provides a high-speed optical fiber communications link between host channels and control units.
- ZAPx is a processor adapter based on the PowerPC running the Nucleus operating system. The ZAP5 card does not have a corresponding I/O board in the back of the chassis, all I/O connections are provided on the ZAP5 card.

Table 2-2 HMB3(Hardware Monitor Board) Indicators

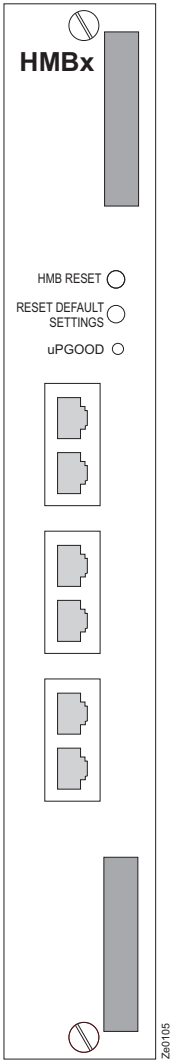
Circuit Card	Switch/ Indicator	Function	Normal Operation
	HMB RESET switch	Pushing this switch resets the board without losing any changes that have been made by the user.	N/A
	RESET DEFAULT SETTINGS switch	The board returns to the original default options when the following actions are performed: • This switch is pushed in • The HMB RESET switch is pushed in and then released • This switch is released	N/A
	uP GOOD indicator	This LED pulses on and off at even intervals when the HMB has passed its self test during power up and/or reset. If the HMB fails the self test and requires attention, the LED indicator flashes quickly three times, slowly three times, and then quickly three times. This sequence repeats after a short pause. Refer to Appendix A, HMB3 Default Configuration Settings, for information on the HMB3 port default settings.	Off

Table 2-3 HMA2 (Hardware Monitor Adapter) Indicators

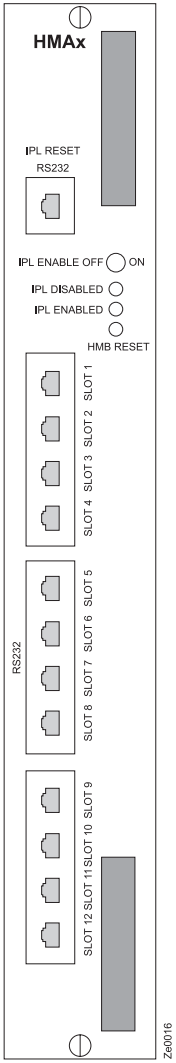
Circuit Card	Switch/ Indicator	Function	Normal Operation
	IPL Enable switch	When set to off, Initial Process Load permission (IPL) is disabled. When set to on, IPL is enabled.	Off
	IPL Disable indicator	When lit, indicates IPL Enable switch is set to off.	On
	IPL Enable indicator	When lit, indicates IPL Enable switch is set to on.	Off
	HMB Reset switch	When depressed, resets the environmental monitor controller on the board.	N/A

Table 2-4 USM (UltraNet Service Monitor Front Panel) Indicators

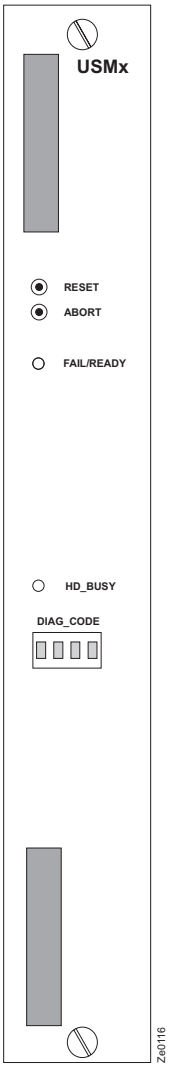
Circuit Card	Port/Indicator	Function	Normal Operation
	RESET switch	Pressing this switch resets all circuitry on the USM board.	N/A
	ABORT switch	Pressing this switch provides a break out of a system lock-up condition.	N/A
	FAIL/READY indicator	When the UltraNet Service Monitor is powered on, this LED will either indicate a fail or ready condition. This is a single tri-color LED. A green lit LED indicates that the USM is ready. A red lit LED indicates that voltage is out of range. An orange lit LED indicates IOP failure.	Green LED is lit
	HD_BUSY indicator	Indicates hard disk drive activity.	Off
	DIAG_CODE display	This is a 4 digit alpha/numeric rolling display that under normal conditions shows the USD-X software revision level. If an error occurs, it displays diagnostic code(s), which are described in Table 2-5 on the following page.	Displays USD-X software revision

Table 2-5 lists and describes the diagnostic display codes for the UltraNet Service Monitor (USM) Application Processor.

Table 2-5 USM Diagnostic Display Codes

Display Code	Description
boot	USM Boot startup successful and ready for operator input
0000	Setup ROM controller registers
0001	i960 EPROM Checksum Compare
001A	Read SDRAM serial EPROM using 12C engine
001B	Setup V380 SDRAM controller registers
001C	Setup SDRAM Banks, DRAM timing parameters, and SDC Bus Watch register
001D	Sending PreCharge, 2 AutoFresh cmds, and Mode Set cmd to SDRAM
0002	Walking ones test on the UART
0003	Walking ones test on a first memory location
0004	Write/read test on first 4 long word memory locations
0005	Write/read test on first 4 Megabytes of SDRAM.
0006	Performing a size check of memory
0007	Setup SDRAM parity enable
0008	Clearing all memory
0009	Clearing on-chip data RAM
000A	Copying the .data area from EPROM, initializing the BSS area of RAM
000B	Initializing the interrupt table
000C	Initializing the fault table, copying PRCB to RAM
000D	Re-initializing with the RAM-based PRCB
000E	Jumping to Main
000F	Connecting IOP to COM2

Table 2-5 USM Diagnostic Display Codes (Continued)

Display Code	Description
0010	Initializing Timer
0011	Testing DUART loopback
0012	Initializing DUART COM2
0013	Installing interrupt vectors, enabling timer, and UART interrupts
0014	Setup Secondary ATU to mask out Master Aborts from host
0015	Clearing retry bit, testing for PMC cards
0016	Write/read test from 4 Megabyte boundary up to end of SDRAM
ER80	Unsupported interrupt has occurred
ER81	Unsupported fault condition occurred
ER82	Unexpected Secondary ATU or Bridge PCI error
ER83	Unexpected Primary ATU or Bridge PCI error
ER84	Unexpected message unit interrupt
ER85	Local bus or memory fault
ER86	Watch dog timeout
ER87	Unexpected Level 7 interrupt detected
ER88	SDRAM parity error
ER89	Unknown or external NMI error
ER90	UART test failed
ER91	Failed walking ones test on a first memory location
ER92	Failed write/read test on first 4 long word memory locations
ER93	Failed write/read test on all memory locations
ER94	Failed write/read test on V380 general purpose register #0
ER95	MCBus interrupt could not clear (stuck active)

Table 2-5 USM Diagnostic Display Codes (Continued)

Display Code	Description
ER96	Memory detected on SDRAM does not compare to value from SDRAM Serial Prom
ER97	i960 EPROM Checksum Mismatch

Table 2-6 USMIO (UltraNet Service Monitor I/O Adapter) Indicator and Ports

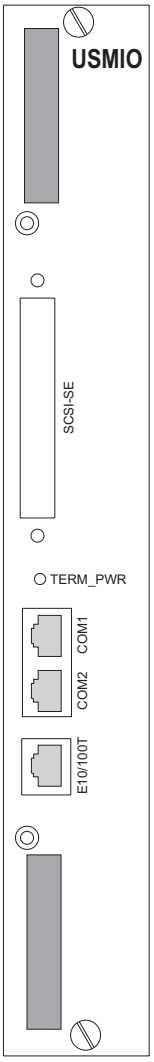
Circuit Card	Port/Indicator	Function	Normal Operation
	SCSI-SE Port	This port provides access to the SCSI Single Ended port via a high density 68-pin connector. *See* the "Service Monitor SCSI Cabling" section in Chapter 1 for the instructions on how to connect this cable to the rear panel of the chassis.	N/A
	TERM_PWR Indicator	Indicates that SCSI terminator power is available.	On
	COM1 Port	This port provides access to the RS-232 COM3/TTYC port via a RJ-45 8-pin connector. This is the PPP port, which is used for connecting the UltraNet Service Monitor application processor (Primary and Secondary) to the HMB3.	N/A
	COM2 Port	This port provides access to the RS-232 COM3/TTYC port via a RJ-45 port 8-pin connector. The use for this port is currently undefined, it can be treated as a spare PPP port.	N/A
	E10/100T Port	This port provides access to an Ethernet auto negotiating 10/100BaseT port via a RJ-45 8-pin connector.	N/A

Table 2-7 ZSP (SPARC Application Processor) Indicators

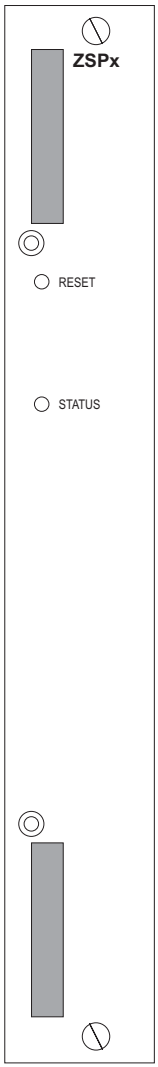
Circuit Card	Switch/ Indicator	Function	Normal Operation
	Reset switch	When depressed, resets the SPARC processor.	N/A
	Status indicator	When lit, indicates startup hardware diagnostic checks are done and system is ready.	On

Table 2-8 ZSIO (SBus I/O) Indicators

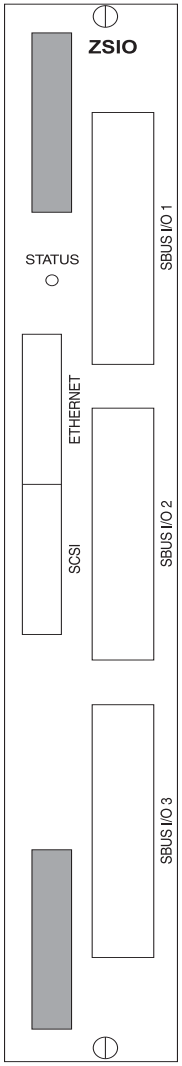
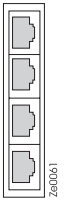
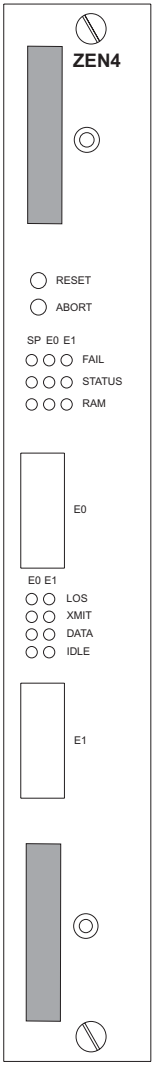
Circuit Board	Port/ Indicator	Function	Normal Operation
	Status indicator	When lit, indicates power to this SBus I/O card.	On
	SBUS I/O port 1	All Primary and Secondary Service Monitors contain the 4 Serial (RJ-45) ports here. Note: All four RJ-45 ports are fully functional. All ATM application processors contain an ATM port here. The ATM port and 4 Serial (RJ-45) ports are shown below:	N/A
		4 Serial (RJ-45) Ports 	On

Table 2-9 ZEN4 (ESCON) Switches and Indicators

Circuit Board	Switch/ Indicator	Function	Normal Operation
	RESET switch	When depressed this switch resets the ESCON processor.	N/A
	ABORT switch	When depressed this switch halts software execution on the processor.	N/A
	SP FAIL indicator	When lit, indicates the switch processor has detected a fatal error.	Off
	E0 FAIL indicator	When lit, indicates the ESCON Port 0 processor has detected a fatal error.	Off
	E1 FAIL indicator	When lit, indicates the ESCON Port 1 processor has detected a fatal error.	Off
	SP STATUS indicator	When lit, indicates a switch processor heartbeat.	Blinking
	E0 STATUS indicator	When lit, indicates an ESCON Port 0 processor heartbeat.	Blinking
	E1 STATUS indicator	When lit, indicates an ESCON Port 1 processor heartbeat.	Blinking
	SP RAM indicator	When lit, indicates global memory is being accessed.	On
	E0 RAM indicator	When lit, indicates global memory is being accessed.	On
	E1 RAM indicator	When lit, indicates global memory is being accessed.	On
	E0 LOS indicator	When lit, indicates the ESCON Port 0 cable connection is not present.	Off
	E1 LOS indicator	When lit, indicates the ESCON Port 1 cable connection is not present.	Off
	E0 XMIT indicator	When lit, indicates data being transmitted on ESCON Port 0.	Off or Blinking

Continued on the next page.

Table 2-9 ZEN4 (ESCON) Switches and Indicators (Continued)

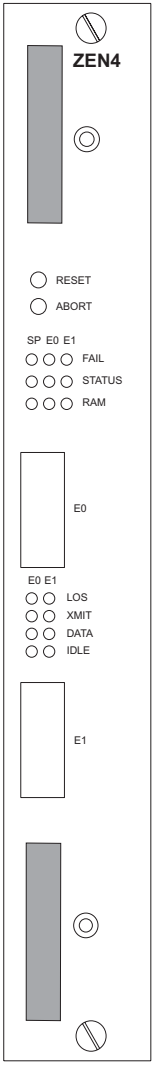
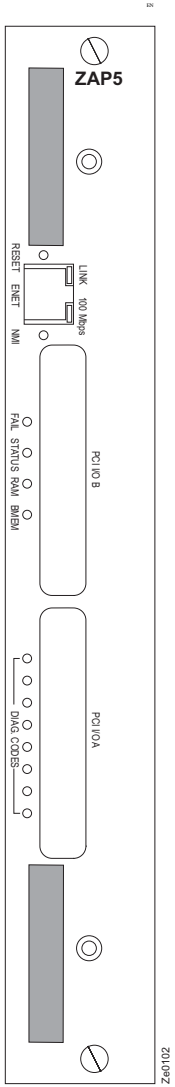
Circuit Board	Switch/ Indicator	Function	Normal Operation
	E1 XMIT indicator	When lit, indicates data being transmitted on ESCON Port 1.	Off or Blinking
	E0 DATA indicator	When lit, indicates data being received on ESCON Port 0.	Off or Blinking
	E1 DATA indicator	When lit, indicates data being received on ESCON Port 1.	Off or Blinking
	E0 IDLE indicator	When lit, indicates E0 Port is connected. Note: If E0 Port is not connected, the indicator is off.	On
	E1 IDLE indicator	When lit, indicates E1 Port is connected. Note: If E1 Port is not connected, the indicator is off.	On

Table 2-10 ZAP5 (PowerPC) Switches and Indicators

Circuit Card	Switch/ Indicator	Function	Normal Operation
	Reset switch	When depressed, resets the application processor.	N/A
	NMI switch	When depressed, aborts all PowerPC processor activity.	N/A
	ENET: LINK indicator	Indicates scrambler lock and receipt of valid idle codes in 100 Mbps operation.	Off or Blinking
	ENET: 100 Mbps indicator	Indicates that 100 Mbps operation is selected.	Off or Blinking
	FAIL indicator	When lit, indicates the PowerPC processor has detected a fatal error.	Off
	STATUS indicator*	When lit, indicates startup hardware diagnostics checks are done and system is ready.	Blinking
	RAM indicator*	When lit, indicates RAM activity.	Off or Blinking
	BMEM indicator	When lit, indicates there is buffer memory data activity.	Off or Blinking
	DIAG CODES	For descriptions see Table 2-11.	N/A

* If both Status and RAM indicators are solid red and all other LEDs are off, it is likely that the ZAP5 has panicked and has entered its boot prom.

See Table 0-1 on page -26 for LED descriptions for the PCI adapter cards.

Table 2-11 provides the power-up diagnostic code sequence for the ZAP5 card. The sequence has nine phases, which are listed in numerical order from top to bottom.

Table 2-11 ZAP5 Power-Up Diagnostic Code Sequence

# in Sequence	LED Code	Description
1		MPC107 initialized (Master Bridge)
2		NVRAM access completed
3		Start UART initialization
4		UART line control and speed set
5		UART FIFOs and status registers cleared

Table 2-11 ZAP5 Power-Up Diagnostic Code Sequence (Continued)

# in Sequence	LED Code	Description
6	○ ○ ○ ● ● ● ● ●	UART initialization complete DTS and RTS have been enabled
7	○ ○ ● ● ○ ○ ○ ○	Remote Reset and NMI have been enabled
8	● ● ● ● ● ● ● ●	BSS Memory has been zeroed out
9	○ ○ ○ ○ ○ ○ ○ ○	Console serial port speed displayed (see the ZAP5 Console Port Speed LED Codes table on page -24)

Table 2-11 ZAP5 Power-Up Diagnostic Code Sequence (Continued)

# in Sequence	LED Code	Description
Not Applicable		Two rotating lights indicate that ZAP5 is idle and is waiting to load software when autoboot is not enabled
Not Applicable		Rotating lights indicate that ZAP5 is loading software

Table 2-12 ZAP5 Console Serial Port Speed LED Codes

LED Code	Description
● = On ○ = Off	The ZAP Diag Code LEDs display a code for the console serial port speed during console setup. The code displays for only a few seconds during boot up.
	9600 bps
	19.2 kbps

Table 2-12 ZAP5 Console Serial Port Speed LED Codes

LED Code	Description
○ ● ● ● ● ● ● ●	38.4 kbps
● ● ● ● ● ● ● ●	57.6 kbps

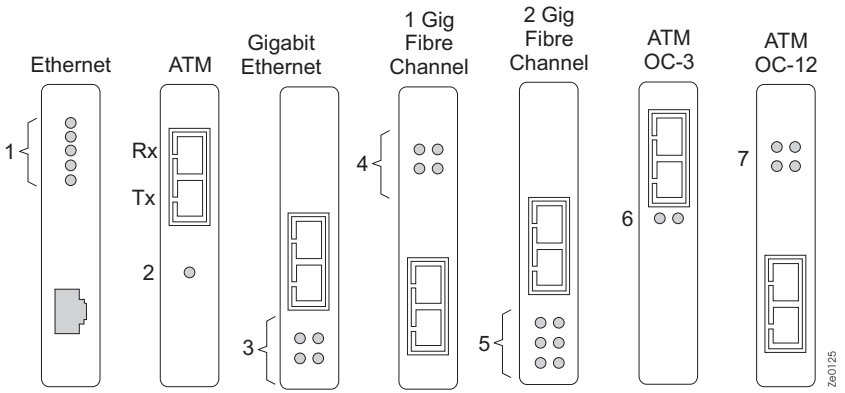


Figure 2-7 PCI Board Indicators

Table 0-1 describes the indicators shown in Figure 2-7. Indicators are listed in the order they are shown in the Figure 2-7 and are grouped by board type.

Table 0-1 PCI Board Indicator Information

Indicator Number	Board Type	Indicator Name	Function	Normal Operation
1	Ethernet (10/100 Mbps Ethernet)	100Tx	When lit, indicates 100BaseTx mode is operating.	N/A
	Ethernet (10/100 Mbps Ethernet)	CF	When lit, indicates a collision on the link.	Blinking
	Ethernet (10/100 Mbps Ethernet)	Rx	When lit, indicates there is reception on the link.	Blinking
	Ethernet (10/100 Mbps Ethernet)	Tx	When lit, indicates there is transmission on the link.	Blinking
	Ethernet (10/100 Mbps Ethernet)	LINK	When lit, indicates the link is up	On
2	ATM	Link indicator	When lit, indicates link is established to an active network.	*On
3	Gigabit Ethernet	RX_ACT	When blinking, indicates there is data transmission on the link. Note: When the cable is disconnected, no LEDs on the Gigabit Ethernet board are lit.	Blinking
	Gigabit Ethernet	TX_ACT	When blinking, indicates there is data transmission on the link. Note: When the cable is disconnected, no LEDs on the Gigabit Ethernet board are lit.	Blinking
	Gigabit Ethernet	LINK_UP	When lit, indicates the link is good. Note: When the cable is disconnected, no LEDs on the Gigabit Ethernet board are lit.	On

Table 0-1 PCI Board Indicator Information (Continued)

Indicator Number	Board Type	Indicator Name	Function	Normal Operation
	Gigabit Ethernet	AUX	When lit, indicates the link is good. Note: When the cable is disconnected, no LEDs on the Gigabit Ethernet board are lit.	On
4	1 Gig Fibre Channel	STATUS	When lit, indicates startup hardware diagnostics checks are done and system is ready.	Off
	1 Gig Fibre Channel	TX_E	When lit, indicates there is data transmission on the link.	On
	1 Gig Fibre Channel	RX_OK	When lit, indicates there is data transmission on the link.	On
	1 Gig Fibre Channel	TX_OK	When lit, indicates there is data transmission on the link.	On
5	2 Gig Fibre Channel	LED2	When lit, indicates there is a connection.	On
	2 Gig Fibre Channel	LED1	When lit, indicates there is a connection.	On
	2 Gig Fibre Channel	RxtOS	When lit, indicates there is nothing connected.	Off
	2 Gig Fibre Channel	TxFLT	When lit, indicates that transmit power has exceeded the limit and the transceiver has been shut down.	Off
	2 Gig Fibre Channel	RxACT	When lit, indicates there is data transmission on the link. Note: During data transmission both the RxACT and TxACT LEDs will flicker.	Blinking
	2 Gig Fibre Channel	TxACT	When lit, indicates there is data transmission on the link. Note: During data transmission both the RxACT and TxACT LEDs will flicker.	Blinking
6	ATM OC-3	XMIT	When lit, indicates there is data transmission on the link.	On
	ATM OC-3	ALARM	When lit, indicates that the cable on one or both sides of the link is disconnected.	Off

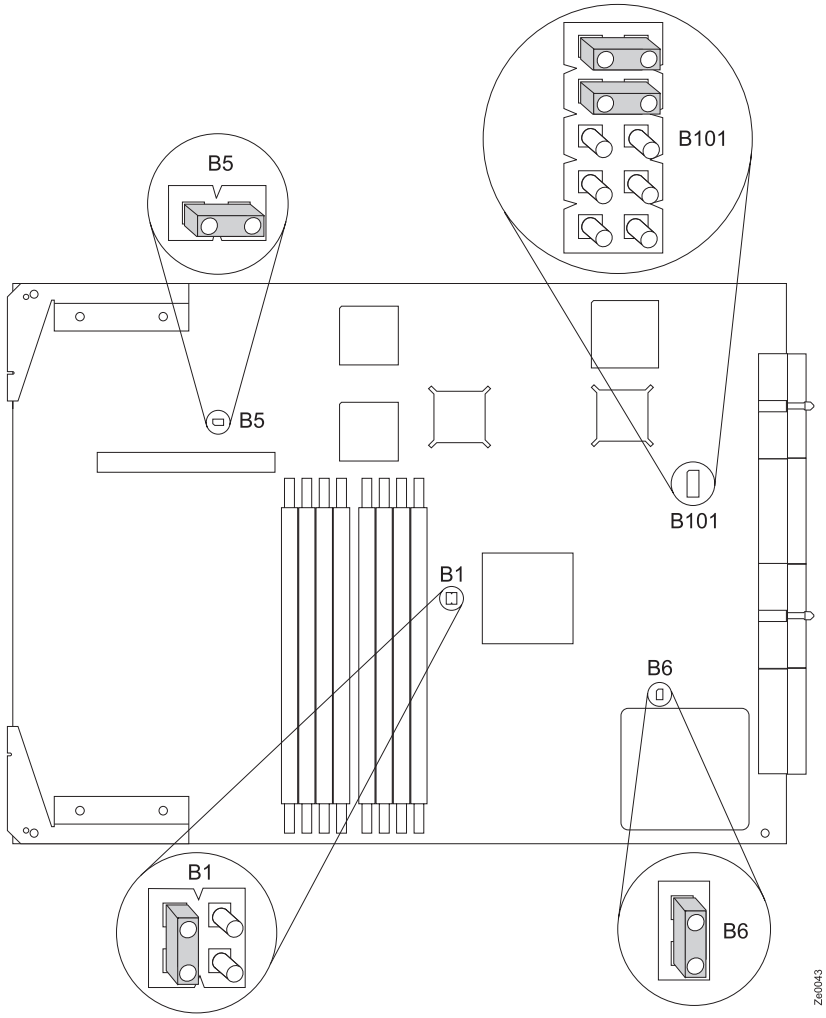
Table 0-1 PCI Board Indicator Information (Continued)

Indicator Number	Board Type	Indicator Name	Function	Normal Operation
7	ATM OC-12	2	When lit, indicates that data is being transmitted. Note: The blinking of LEDs 2, 3, and 1/CD alternates during data transmission.	Blinking
	ATM OC-12	3	When lit, indicates that data is being transmitted. Note: The blinking of LEDs 2, 3, and 1/CD alternates during data transmission.	Blinking
	ATM OC-12	0	When lit, indicates that the link is idle.	On
	ATM OC-12	1/CD	When lit, indicates that data is being transmitted. Note: The blinking of LEDs 2, 3, and 1/CD alternates during data transmission.	Blinking

*If the LINK indicator is off, check Tx and Rx (a common cause is that the Tx and Rx are swapped).

Circuit Board Jumper Settings

The Service Monitor application processor; part number 20501327 (ZSP2) and 20501900, have the following jumper settings:



Application Processor Jumper Settings

3

Maintenance Procedures

This chapter contains procedures for the removal and installation of the circuit cards, fan tray, power supplies, Application Processor hard disk, Master and Slave Switch Card(s), midplane fuses, CD-RW drive, and DAT drive.

Only McDATA-trained service personnel should remove or install the circuit cards.

Circuit Card Removal and Installation Procedures

This section contains the procedures for removing or installing the circuit cards in the USD-X. All circuit cards for the USD-X are hot-swappable except the Master and Slave switch cards. Hot-swappable allows the circuit card to be removed or installed when power is on.

CAUTION

Attach a wrist strap and follow ESD procedures during the handling of all electronic components.

For all procedures, follow the "Grounding Procedure" provided in the *UltraNet Storage Director - eXtended Site Preparation User Guide*. For all removal procedures, locate an anti-static bag.

The following cards each have a specific removal and installation procedure:

- Hardware Monitor Board (HMBx)
- UltraNet Service Monitor (USM) Application Processor
- SPARC (ZSP) Application Processor
- UltraNet Service Monitor I/O Adapter (USMIO)
- SBus I/O Adapter (ZSIO)
- ESCON Adapter (ZENx)
- PowerPC Adapter (ZAPx)
- PCI I/O Adapter (PCI) and all PCI Network Interface Cards (NIC)
- Master and Slave Switch

NOTE: The *UltraNet Command Reference* document contains commands that are useful during maintenance procedures.

Hardware Monitor Board Removal Procedure

The Hardware Monitor Board (HMBx) is the replacement for the Hardware Monitor Adapter (HMAx). The Hardware Monitor Board has the capability to monitor the USD-X hardware components without the use of the WTI/Penril switch. Use the following procedure to remove a Hardware Monitor Board from the USD-X:

NOTE: This procedure will differ slightly if you are removing a Hardware Monitor Adapter (HMAx). These differences are noted in the procedure.

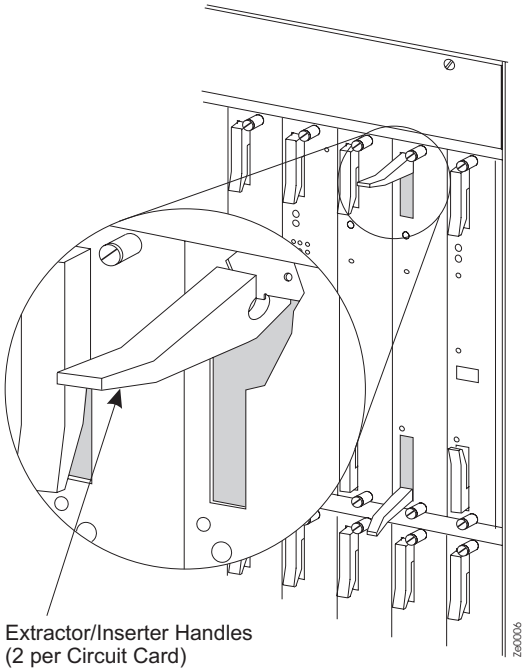
Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Make a note of where the cables are located, and remove the RJ-45 connectors from the Hardware Monitor Board.

NOTE: Do not make a note of the cable locations if you are removing a Hardware Monitor Adapter (HMAx). The replacement for the Hardware Monitor Adapter uses fewer cables.

NOTE: You do not need to remove power from the system.

2. Use the medium straight slot screwdriver to remove the top and bottom screws holding the Hardware Monitor Board in place.
3. Use both the top and bottom extractor/inserter handles to remove the Hardware Monitor Board from the slot.



4. Place the Hardware Monitor Board in an anti-static bag. If you removed a Hardware Monitor Board (HMBx), you have completed this procedure. If you removed a Hardware Monitor Adapter (HMAx), complete the next step.
5. Power down the WTI/Penril switch and remove all cabling from the switch.

NOTE: You do not need to remove the WTI/Penril switch from its present location.

Hardware Monitor Board Installation Procedure

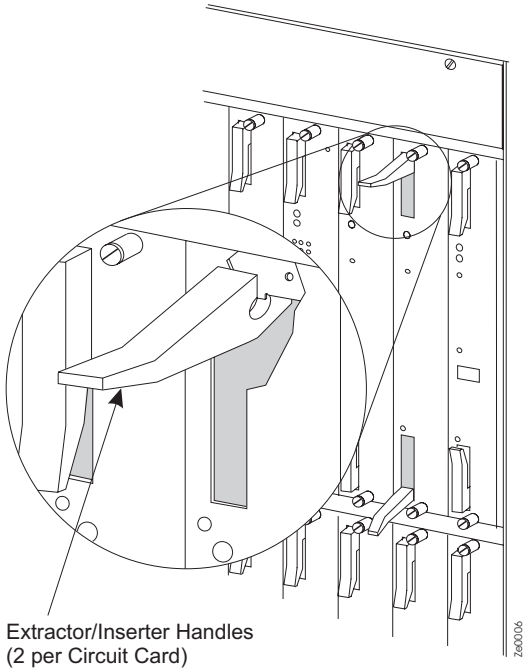
Use the following procedure to install the Hardware Monitor Board into the USD-X:

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Remove the Hardware Monitor Board from the anti-static bag.

NOTE: You do not need to remove power from the system.

2. Position the Hardware Monitor Board in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
3. Use the extractor/inserter handles to insert the circuit card into place.



4. Use the medium size straight slot screwdriver to tighten the top and bottom screws to secure the circuit card in place.
5. Install the RJ-45 cables.
6. Use the cabling procedures outlined in the "Hardware Monitor Board Cabling" section in Chapter 1, to connect the Hardware Monitor Board to the Primary Service Monitor, Secondary Service Monitor, modem, and PC.
7. After you have completed the cabling, validate connectivity to the Hardware Monitor Board by dialing in or by opening up the terminal emulator.

Refer to Appendix A, HMB3 Default Configuration Settings, for information on the default port settings for the Hardware Monitor Board.

UltraNet Service Monitor (USM) Removal and Installation Procedures

This section provides the procedures for removing and installing the UltraNet Service Monitor (USM) for a USD-X. The procedures differ based on whether the Service Monitor you are removing or installing is a Primary Service Monitor or a Secondary Service Monitor. A separate set of procedures are provided for each Service Monitor type.

The main function of the Service Monitor is to perform the following system management tasks:

- McDATA software or firmware, diagnostics, and utilities
- system configuration, is stored on the hard disk drive
- SNMP
- performing the hardware monitor functions
- routing protocols (RIP)
- loading, dumping, and trace functions of other adapters
- remote support tools

Service Monitor Types

Each Service Monitor is either designated as a Primary Service Monitor or Secondary Service Monitor and only one of the Service Monitors can be active at one time. Following is a description of each:

- Primary Service Monitor - The Primary Service Monitor by convention, is the application processor with the cable connection to the auxiliary CD-RW drive. The Primary Service Monitor has the authoritative copy of the configuration database on its hard disk. The Primary Service Monitor periodically replicates the configuration database from its hard disk out to the Secondary Service Monitor (if one is installed). There is only one Primary Service Monitor in a USD-X.
- Secondary Service Monitor - The Secondary Service Monitor has a read only replicated copy of the configuration database. When the Secondary Service Monitor is set as the active Service Monitor, all functions of a Service Monitor (listed above) are available except the configuration database cannot be modified. There can be one or no Secondary Service Monitor.

- Active Service Monitor - The active Service Monitor is the Primary or Secondary Service Monitor that is currently performing the Service Monitor functions. There is one active Service Monitor at any given point in time. References to the Service Monitor in this document are to the active Service Monitor.

Primary Service Monitor (USM) Removal Procedure

When the USD-X is configured with one application processor as the Service Monitor and no Secondary Service Monitor, other application processor(s) do not take over the Service Monitor functions in the event of a failure. The Service Monitor can be hot-swapped, (shutdown and re-booted) while traffic is running in the system. The data traffic is not affected by this action. However, any operation that requires Service Monitor functionality cannot be performed until the Service Monitor comes back online.

When the USD-X is configured with a Primary Service Monitor and a Secondary Service Monitor, the Secondary Service Monitor becomes the active Service Monitor in the event of a Primary Service Monitor failure.

Use the following procedure to remove a Primary Service Monitor from a USD-X (slot 6):

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Follow the instructions contained in the "Performing a Complete Backup" section in Chapter 5 to backup the configuration files to a CD-RW drive.

NOTE: You do not need to remove power from the system.

---

2. Use the following command string to shutdown the Service Monitor:

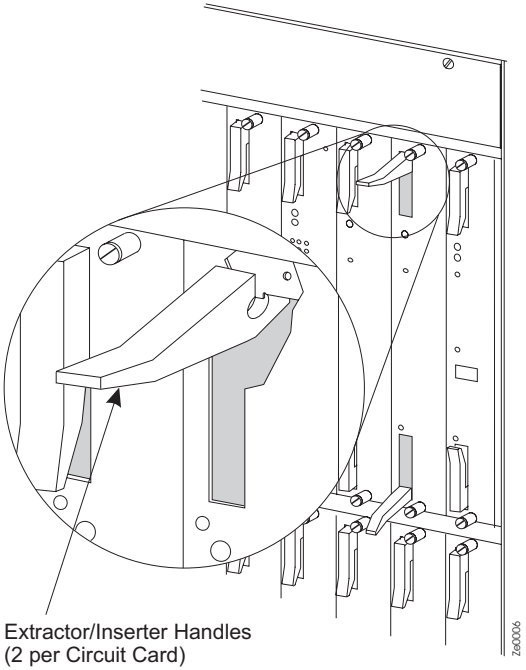
```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

---

3. Use the medium straight slot screwdriver to remove the top and bottom screws holding the Service Monitor in place.

4. Use both the top and bottom extractor/inserter handles to remove the Service Monitor from the slot.



5. If the hard disk needs to be replaced, continue at Step 4 of the "Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation" section later in this chapter.
6. Place the Service Monitor into an anti-static bag.

Primary Service Monitor (USM) Installation Procedure

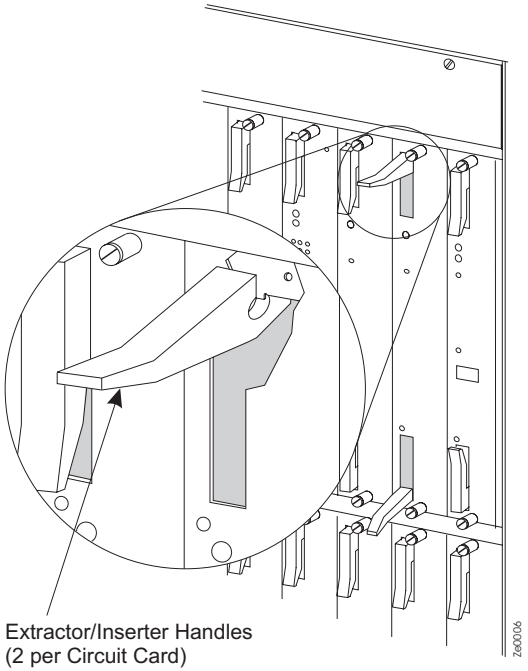
Use the following procedure to install a Primary Service Monitor into the USD-X (slot 6):

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Remove the application processor adapter from the anti-static bag.

NOTE: You do not need to remove power from the system.

2. Install the application processor hard disk using the "Application Processor Hard Disk Replacement Procedure" section later in this chapter.
3. Position the application processor adapter in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
4. Use the extractor/inserter handles to insert the application processor adapter into place.



5. Use the medium straight slot screwdriver to tighten the top and bottom screws to secure the circuit card in place.
6. If you did not replace the hard disk with the spare hard disk, continue at Step 9.
7. Restore the configuration files from the CD-RW drive using the "Performing Restore Operations from a CD" section in Chapter 5.
8. Use the following command to set the application processor as a Primary Service Monitor:

```
/opt/CMNTsm/support/setup_sm primary
```

9. Clear the service LED that is located below the CD-RW, using the **`serv_led_chg 0`** command.

Secondary Service Monitor (USM) Removal Procedure

If you have a USD-X with an active Secondary Service Monitor, find out why you do not have your Primary Service Monitor active, and make any necessary repairs to re-enable it. An active Secondary Service Monitor should not be removed until the Primary Service Monitor becomes active again.

Use the following procedure to remove a Secondary Service Monitor from the USD-X (slot 12):

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

---

1. Use the instructions outlined in the "Performing a Complete Backup" section in Chapter 5, to backup the configuration files to the CD-RW drive.
2. Use the following command string to shutdown the Service Monitor:

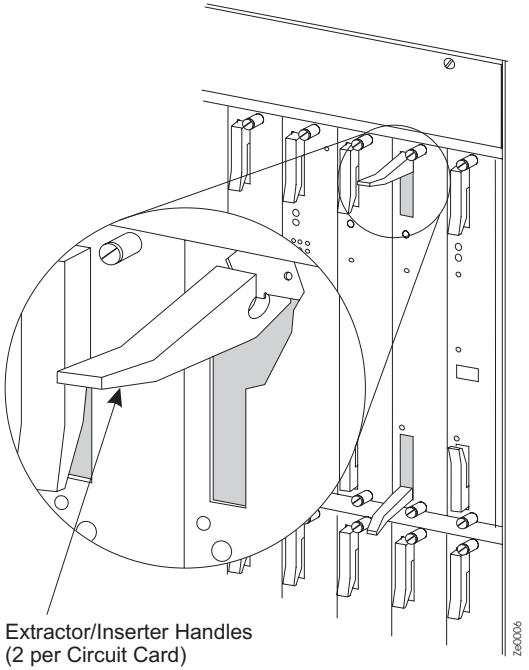
```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

---

3. Use the medium straight slot screwdriver to remove the top and bottom screws holding the Secondary Service Monitor in place.

4. Use both the top and bottom extractor/inserter handles to remove the Secondary Service Monitor from the slot.



5. If the hard disk needs replacing, or if you are only replacing the application processor, continue with Step 4 of the "Application Processor Hard Disk Replacement Procedure" later in this chapter.
6. Place the Secondary Service Monitor into an anti-static bag.

Secondary Service Monitor (USM) Installation Procedure

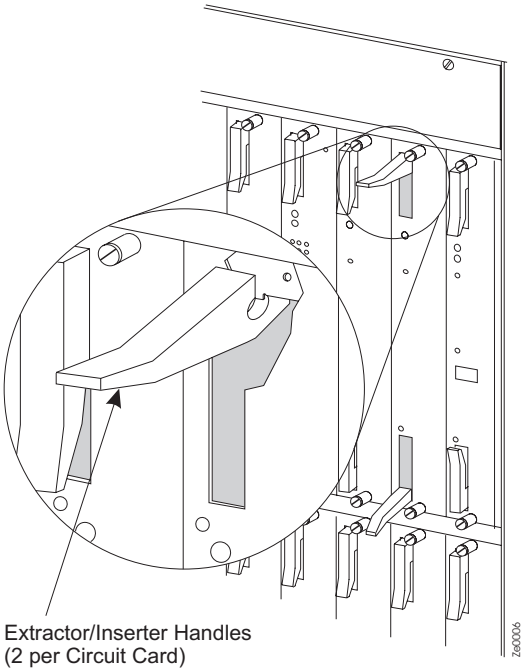
Use the following procedure to install a Secondary Service Monitor in the USD-X (slot 12):

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the application processor adapter from the anti-static bag.

2. Install the application processor hard disk using the "Application Processor Hard Disk Replacement Procedure" later in this chapter.
3. Position the Service Monitor in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
4. Use the extractor/inserter handles to insert the Service Monitor into place.



5. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the Service Monitor in place.
6. If you did not replace the hard disk with the spare hard disk, continue at Step 9.
7. Restore the configuration files from the CD-RW drive using the instructions outlined in the "Performing Restore Operations from a CD" section in Chapter 5.
8. Use the following command to set the application processor as a Secondary Service Monitor:

```
/opt/CMNTsm/support/setup_sm secondary
```

9. Clear the service LED that is located below the CD-RW drive, using the **`serv_led_chg 0`** command.

ZSP Application Processor Removal and Installation Procedures

The sections that follow provide the removal and installation procedures for the SPARC (ZSP) Application Processor.

Overview

The ZSP application processor can be configured as a Service Monitor or not as a Service Monitor. If the application processor is configured as a Service Monitor, its main function is to perform the following system management tasks:

- McDATA software or firmware, diagnostics, and utilities
- system configuration, is stored on the hard disk drive
- SNMP
- performing the hardware monitor functions
- routing protocols (RIP)
- loading, dumping, and trace functions of other adapters
- remote support tools

When an application processor is a Service Monitor, the application processor is either a Primary Service Monitor or Secondary Service Monitor, and only one of the Service Monitors can be active at one time. Following is a description of each:

- Primary Service Monitor - The Primary Service Monitor by convention, is the application processor with the SCSI cable connection to the auxiliary DAT tape drive. The Primary Service Monitor has the authoritative copy of the configuration database on its hard disk. The Primary Service Monitor periodically replicates the configuration database from its hard disk out to the Secondary Service Monitor (if one is installed). There is only one Primary Service Monitor in a USD-X.
- Secondary Service Monitor - The Secondary Service Monitor has a read only replicated copy of the configuration database. When the Secondary Service Monitor is set as the active Service Monitor, all

functions of a Service Monitor (listed above) are available except the configuration database cannot be modified. There can be one or no Secondary Service Monitor.

- Active Service Monitor - The active Service Monitor is the Primary or Secondary Service Monitor that is currently performing the Service Monitor functions. There is one active Service Monitor at any given point in time. References to the Service Monitor in this document are to the active Service Monitor.

The following subsections contain removal and replacement procedures for each of the application processor configurations, the Primary Service Monitor, the Secondary Service Monitor, and non-Service Monitor application processor(s).

NOTE: The application processor is not spared with a hard disk installed. Therefore, prior to installing an application processor, install a hard disk using the "Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation" section later in this chapter.

Primary Service Monitor (ZSP) Removal Procedure

When the USD-X is configured with one application processor as the Service Monitor and no Secondary Service Monitor, other application processor(s) do not take over the Service Monitor functions in the event of a failure. The Service Monitor can be hot-swapped, (shutdown and re-booted) while traffic is running in the system. The data traffic is not affected by this action. However, any operation that requires Service Monitor functionality cannot be performed until the Service Monitor comes back online.

When the USD-X is configured with a Primary Service Monitor and one or more Secondary Service Monitor(s), the Secondary Service Monitor becomes the active Service Monitor in the event of a Primary Service Monitor failure.

Use the following procedure to remove a Primary Service Monitor from a USD-X (slot 6):

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Use the "Configuration Backup Procedure" later in this chapter to backup the configuration files to a DAT drive.
2. Use the following command string to shutdown the Service Monitor:

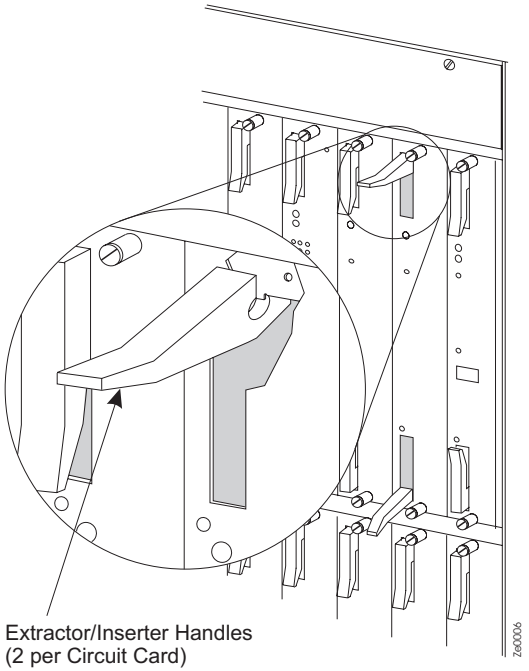
```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

3. Use the medium straight slot screwdriver to remove the top and bottom screws holding the Service Monitor in place.

NOTE: You do not need to remove power from the system.

4. Use both the top and bottom extractor/inserter handles to remove the Service Monitor from the slot.



5. If the hard disk needs to be replaced, continue at Step 4 of the "Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation" section in Chapter 3.
6. Place the Service Monitor into an anti-static bag.

Primary Service Monitor (ZSP) Installation Procedure

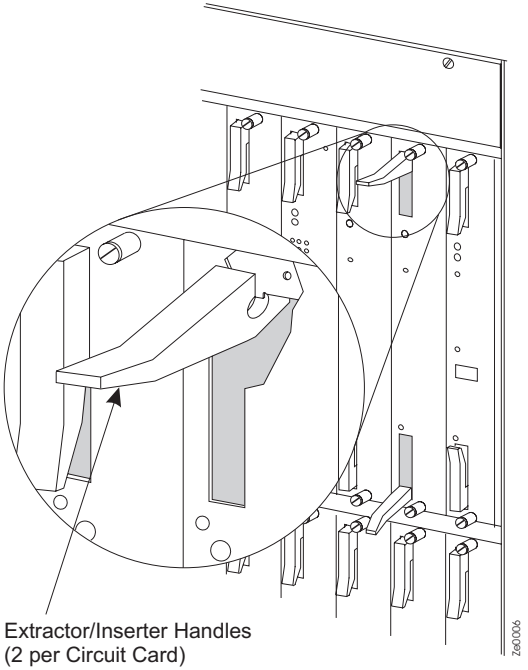
Use the following procedure to install a Primary Service Monitor into the USD-X (slot 6):

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Remove the application processor adapter from the anti-static bag.

NOTE: You do not need to remove power from the system.

2. Install the application processor hard disk using the "Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation" section in Chapter 3.
3. Position the application processor adapter in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
4. Use the extractor/inserter handles to insert the application processor adapter into place.



5. Use the medium straight slot screwdriver to tighten the top and bottom screws to secure the circuit card in place.
6. If you did not replace the hard disk with the spare hard disk, continue at Step 9.
7. Restore the configuration files from the DAT drive using the "Configuration Restore Procedure" later in this chapter.
8. Use the following command to set the application processor as a Primary Service Monitor:

   ```
   /opt/CMNTsm/support/setup_sm primary
   ```

9. Clear the service LED that is located below the DAT drive, using the **`serv_led_chg 0`** command.

Secondary Service Monitor (ZSP) Removal Procedure

If you have a USD-X with an active Secondary Service Monitor, find out why you do not have your Primary Service Monitor active, and make any necessary repairs to re-enable it. An active Secondary Service Monitor should not be removed until the Primary Service Monitor becomes active again.

Use the following procedure to remove a Secondary Service Monitor from the USD-X (slot 12):

Tools Required: A medium straight slot screwdriver is required for this procedure.

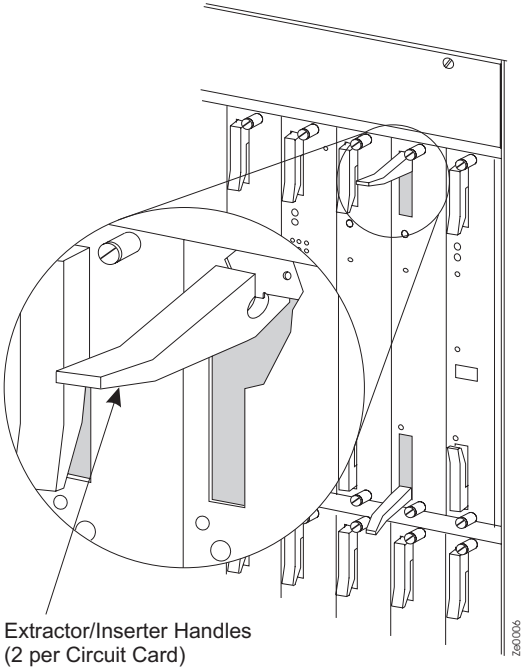
NOTE: You do not need to remove power from the system.

1. Use the "Configuration Backup Procedure" section later in this chapter to backup the configuration files to the DAT tape.
2. Use the following command string to shutdown the Service Monitor:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

3. Use the medium straight slot screwdriver to remove the top and bottom screws holding the Secondary Service Monitor in place.
4. Use both the top and bottom extractor/inserter handles to remove the Secondary Service Monitor from the slot.



5. If the hard disk needs replacing, or you are only replacing the application processor, continue with Step 4 of the "Application Processor Hard Disk Replacement Procedure" provided on page -54.
6. Place the Secondary Service Monitor into an anti-static bag.

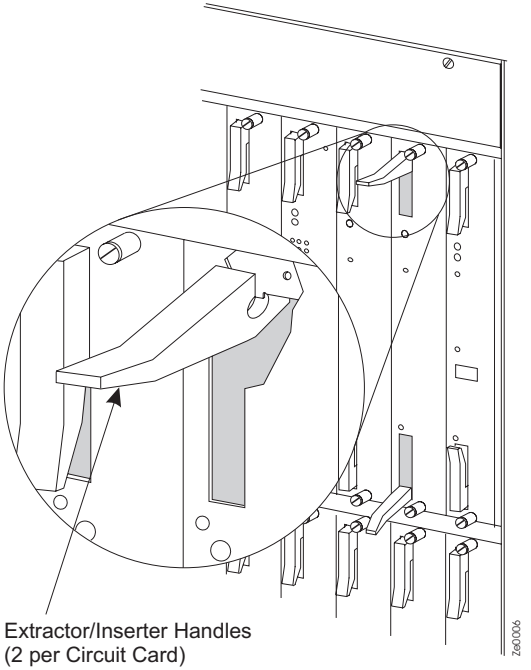
Secondary Service Monitor (ZSP) Installation Procedure

Use the following procedure to install a Secondary Service Monitor in the USD-X (slot 12):

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the Service Monitor (application processor adapter) from the anti-static bag.
2. Install the application processor hard disk using the "Application Processor Hard Disk Replacement Procedure" provided in this chapter.
3. Position the Service Monitor in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
4. Use the extractor/inserter handles to insert the Service Monitor into place.



5. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the Service Monitor in place.
6. If you did not replace the hard disk with the spare hard disk, continue at Step 9.
7. Restore the configuration files from the DAT drive using the "Configuration Restore Procedure" section later in this chapter.
8. Use the following command to set the application processor as a Secondary Service Monitor:

   ```
   /opt/CMNTsm/support/setup_sm secondary
   ```

9. Clear the service LED that is located below the DAT drive, using the **`serv_led_chg 0`** command.

ZSP Application Processor Not Configured as a Service Monitor Removal Procedure

Use the following procedure to remove an application processor that is not configured as a Service Monitor in the USD-X (slot 5 or slot 4):

Tools Required: A medium straight slot screwdriver is required for this procedure.

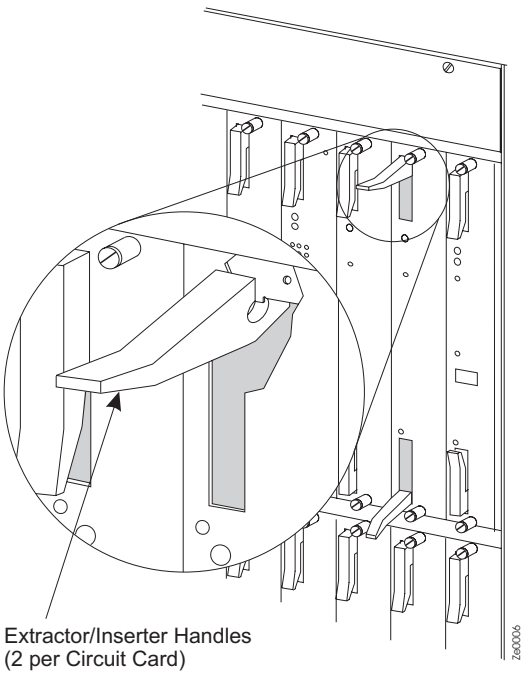
NOTE: You do not need to remove power from the system.

1. Use the following command string to shutdown the application processor:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Use the medium straight slot screwdriver to remove the top and bottom screws holding the application processor in place.
3. Use both the top and bottom extractor/inserter handles to remove the Service Monitor from the slot.



4. If the hard disk needs replacing, or you are only replacing the application processor, continue at Step 4 of the "Application Processor Hard Disk Replacement Procedure" provided on page -54.
5. Place the application processor into an anti-static bag.

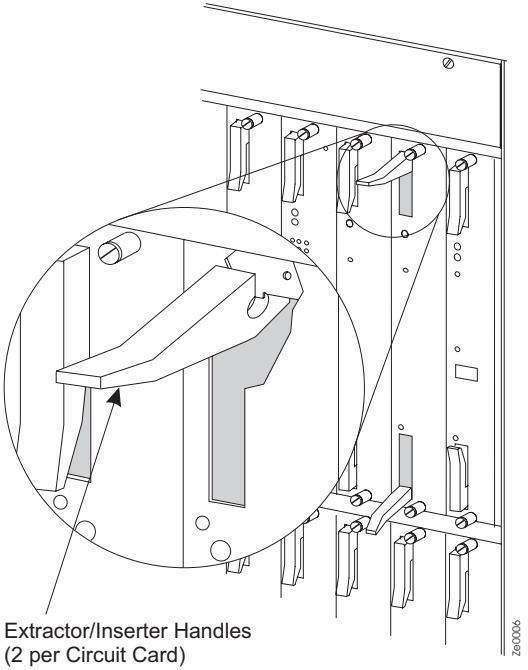
ZSP Application Processor Not Configured as a Service Monitor Installation Procedure

Use the following procedure to install an application processor that is not configured as a Service Monitor in the USD-X (slot 5 or slot 4):

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the application processor adapter from the anti-static bag.
2. Install the application processor hard disk using the "Application Processor Hard Disk Replacement Procedure" section in Chapter 3.
3. Position the application processor in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
4. Use the extractor/inserter handles to insert the application processor into place.



5. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the Service Monitor in place.
6. Clear the service LED that is located below the DAT drive, using the **`serv_led_chg 0`** command.

USM I/O Adapter (USMIO) Removal Procedure

Use the following procedure to remove a USM I/O adapter from the USD-X:.

Tools Required: A medium straight slot screwdriver is required for this procedure.

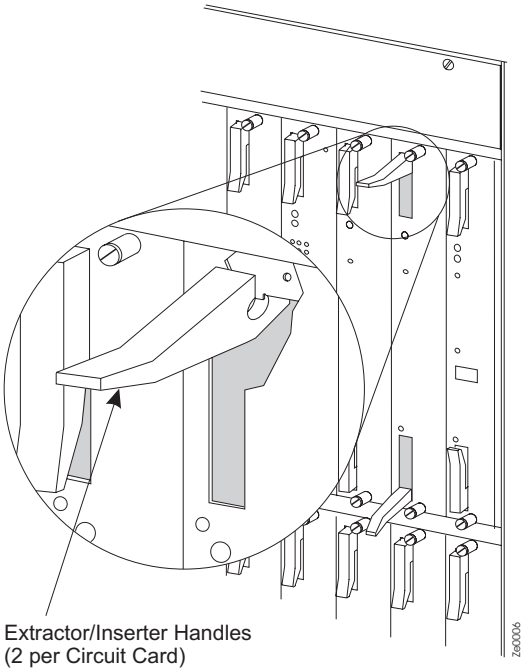
NOTE: You do not need to remove power from the system.

1. Use the following command string to shutdown the system traffic to the USM I/O adapter being removed:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. If cables are attached to the circuit card make a note of where the cables are located.
3. Using the medium straight slot screwdriver, remove the top and bottom screws holding the USM I/O adapter in place.
4. Using both the top and bottom extractor/inserter handles, remove the USM I/O adapter from the slot.



5. Place the USM I/O adapter in an anti-static bag.

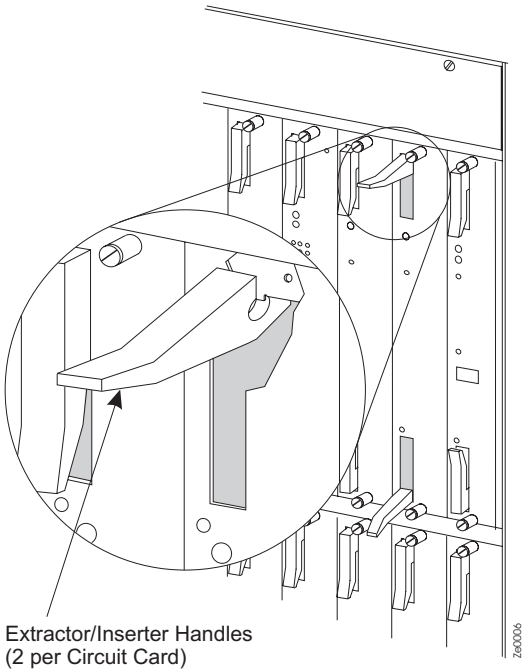
USM I/O Adapter (USMIO) Installation Procedure

The USM I/O adapter installs into the back of the USD-X as a companion to the USM application processor. Use the following procedure to install an USM I/O adapter into the USD-X.

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the USM I/O adapter from the anti-static bag.
2. Position the USM I/O adapter in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
3. Use the extractor/inserter handles to insert the USM I/O adapter into place.



4. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the USM I/O adapter in place.
5. Install the SCSI cable using the "Service Monitor SCSI Cabling" procedure in Chapter 1.
6. Install the RJ-45 cable that connects to the Hardware Monitor Board using the "Hardware Monitor Board Cabling" procedure for either the Primary or Secondary Service Monitor, which is provided in Chapter 1.
7. Clear the service LED that is located below the CD-RW drive, using the **`serv_led_chg 0`** command.
8. Issue a **`reboot`** command to the application processor.

SBus I/O Adapter (ZSIO) Removal Procedure

Use the following procedure to remove a SBus I/O adapter from the USD-X:

Tools Required: A medium and small straight slot screwdriver are required for this procedure.

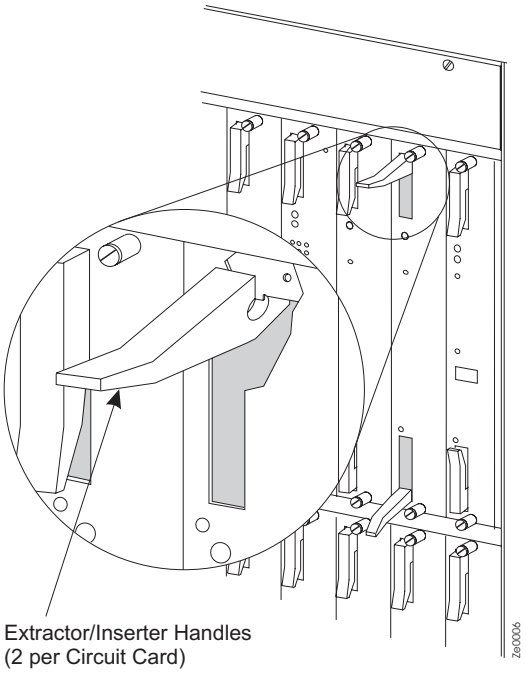
NOTE: You do not need to remove power from the system.

1. Use the following command string to shutdown the system traffic to the SBus I/O adapter being removed:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. If cables are attached to the circuit card make a note of where the cables are located. If there is an Ethernet cable, use the small straight slot screwdriver to remove it.
3. Using the medium straight slot screwdriver, remove the top and bottom screws holding the SBus I/O adapter in place.
4. Using both the top and bottom extractor/inserter handles, remove the SBus I/O adapter from the slot.



5. Place the SBus I/O adapter in an anti-static bag.

4 Serial (RJ-45) Port Removal Procedure

Use the following procedure to remove the 4 Serial (RJ-45) port card from SBus I/O port 1:

Tools Required: A small straight slot screwdriver is required for this procedure.

1. Remove the SBus I/O adapter using the "SBus I/O Adapter (ZSIO) Removal Procedure".
2. Place the SBus I/O adapter onto a static free surface.
3. Remove the two small screws from SBus I/O port 1, these two screws secure the 4 serial (RJ-45) port card to the front panel of the SBus I/O card.
4. Disengage the card's connector from the SBus I/O card.
5. Place the card in an anti-static bag.
6. Use the "4 Serial (RJ-45) Port Installation Procedure" to install a new card.

4 Serial (RJ-45) Port Installation Procedure

Use the following procedure to install the 4 Serial (RJ-45) port card in SBus I/O port 1:

NOTE: The following procedure assumes that you have removed the SBus I/O adapter; if not, use the "SBus I/O Adapter (ZSIO) Removal Procedure" prior to this procedure.

Tools Required: A small straight slot screwdriver is required for this procedure.

1. Align the new 4 Serial (RJ-45) port card into the SBus I/O port 1 faceplate opening and SBus I/O port 1 connector.
2. Press the Serial (RJ-45) port card into the SBus I/O port connector.
3. Secure the card in place using the two small screws and a small straight slot screwdriver.

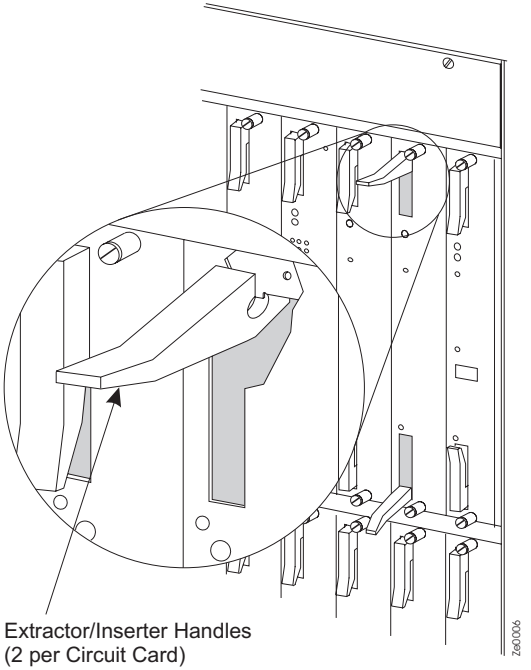
SBus I/O Adapter (ZSIO) Installation Procedure

The SBus adapter installs into the back of the USD-X as a companion to its assigned application processor adapter. Use the following procedure to install an SBus I/O adapter into the USD-X:

Tools Required: A medium and small straight slot screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the SBus I/O adapter from the anti-static bag.
2. Position the SBus adapter in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.
3. Use the extractor/inserter handles to insert the SBus I/O adapter into place.



4. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the SBus adapter in place.
5. Install the cables. If an Ethernet cable was attached, use the small straight slot screwdriver to secure the cable connector back in place.
6. Clear the service LED that is located below the DAT drive, using the **`serv_led_chg 0`** command.
7. Issue a **`reboot`** command to the application processor.

ESCON (ZENx) Adapter Removal Procedure

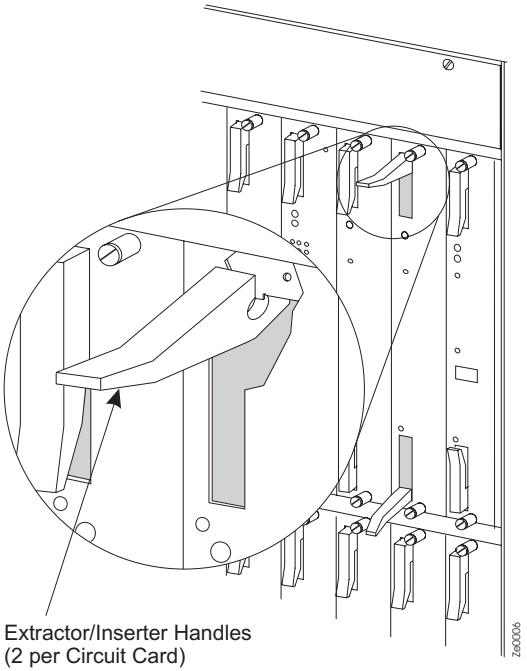
Use the following procedure to remove a ZENx ESCON adapter from the USD-X:

Tools Required: A medium straight slot screwdriver and a small Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the ESCON cable from the front of the ESCON adapter.

2. Use the medium straight slot screwdriver to remove the top and bottom screws holding the ESCON adapter in place.
3. Use both the top and bottom extractor/inserter handles to remove the ESCON adapter from the slot.



4. Place the card in an anti-static bag.

ESCON (ZENx) Adapter Installation Procedure

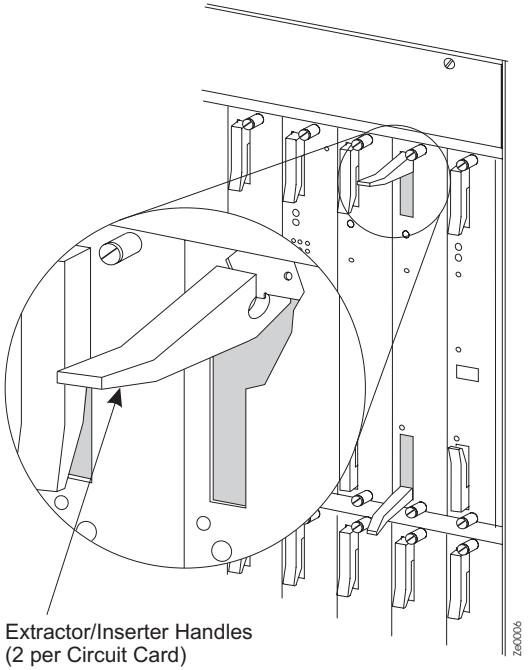
The ESCON adapter installs into the front of the USD-X. Use the following procedure to install an ESCON adapter into the USD-X:

Tools Required: A medium straight slot screwdriver and a small Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

1. Remove the ESCON adapter from the anti-static bag.
2. Position the ESCON adapter in the correct slot location and gently slide it in until approximately 1 inch from the extractor/inserter handles.

3. Use the extractor/inserter handles to insert the ESCON adapter into place.



4. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the ESCON adapter in place.
5. Install the ESCON cable.
6. Clear the service LED that is located below the CD-RW or DAT drive, using the **`serv_led_chg 0`** command.

PowerPC Adapter (ZAP5) and PCI I/O Adapter Card Removal Procedure

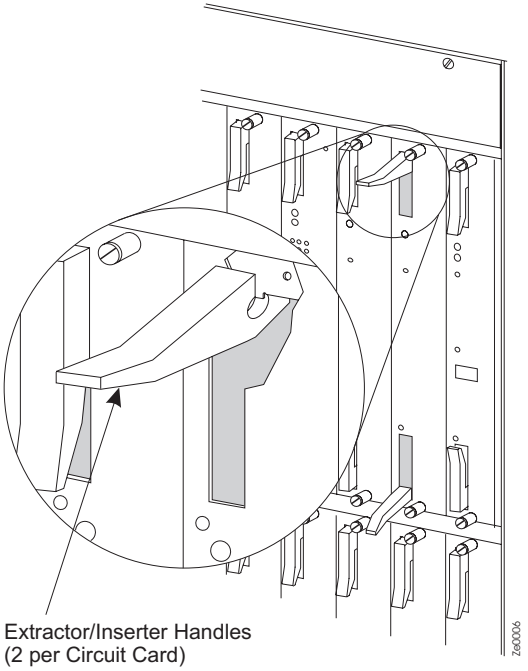
Use the following procedure to remove the PowerPC ZAP5 adapter and its PCI I/O adapter cards:

Tools Required: A medium straight slot screwdriver and medium Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

1. If cables are attached to the ZAP5 adapter, make a note of where the cables are located. Remove all I/O cables from the ZAP5 adapter.

2. Use the medium straight slot screwdriver to remove the top and bottom screws holding the PowerPC ZAP5 adapter in place.
3. Using both the top and bottom extractor/inserter handles, remove the PowerPC ZAP5 adapter from the slot.



4. Place the ZAP5 adapter on an anti-static surface with access to the PCI I/O adapter cards.
5. Using the Phillips screwdriver, remove the two 2.5 mm screws that secure the PCI I/O adapter card to the ZAP5 adapter. Repeat this step for the remaining PCI I/O adapter card.
6. Gently lift the PCI I/O adapter card to disengage it from the ZAP5 adapter connectors. Repeat this step for the remaining PCI I/O adapter card.
7. Place each PCI I/O adapter card into an anti-static bag.
8. Place the ZAP5 adapter into an anti-static bag.

PowerPC Adapter (ZAP5) and PCI I/O Adapter Card Installation Procedure

Use the following procedure to install the ZAP5 adapter and its PCI I/O adapter cards:

Tools Required: A medium straight slot screwdriver and medium Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system; however, halt traffic on each interface on the ZAP5 adapter.

1. Remove the ZAP5 adapter from the anti-static bag.
2. Place the ZAP5 adapter on an anti-static surface with access to the I/O card connectors.
3. For ports PCI I/O B and PCI I/O A, insert the PCI I/O adapter card's bezel into the appropriate PCI cutout on the faceplate of the ZAP5.

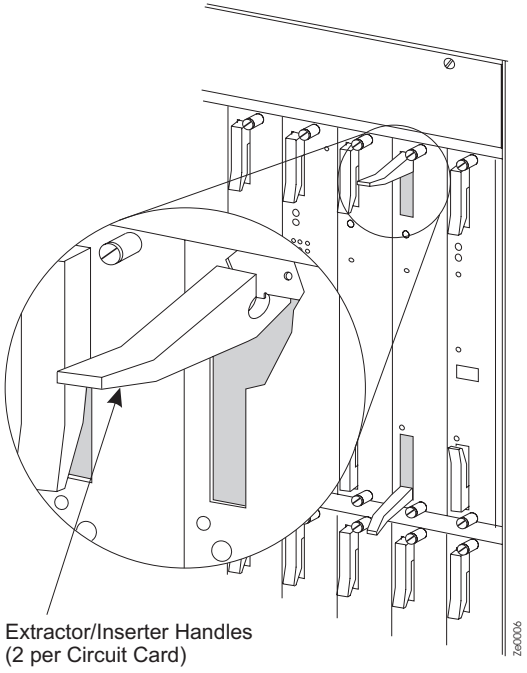
NOTE: Ensure the rubber gasket seats into the PCI I/O cutout.

4. Engage each connector, making sure they are seated completely.

NOTE: If the PCI I/O adapter card's bezel has four threaded screws (such as the DS3/E3 PCI I/O adapter card), then use the four #2-56 screws to secure the bezel to the faceplate of the ZAP5.

5. Using the Phillips screwdriver and two 2.5 mm screws, secure each PCI I/O adapter card to the ZAP5 adapter.
6. Position the PowerPC ZAP5 adapter in the correct slot location and gently slide it in until it is approximately 1 inch from the extractor/inserter handles.

7. Using the extractor/inserter handles, insert the PowerPC ZAP5 adapter into place.



8. Using the medium straight slot screwdriver, tighten the top and bottom screws to secure the PowerPC ZAP5 adapter in place.
9. Reconnect the cabling to ZAP5 ports PCI I/O B and PCI I/O A.
10. Clear the service LED that is located below the CD-RW or DAT drive, using the **`serv_led_chg 0`** command.

Master and Slave Switch Card Removal Procedure

The USD-X contains one master and three slave switch cards located on the front of the switch midplane. For master and slave locations on the F9112 refer to Figure 3-1. For master and slave locations on the F9106 refer to Figure 3-2.

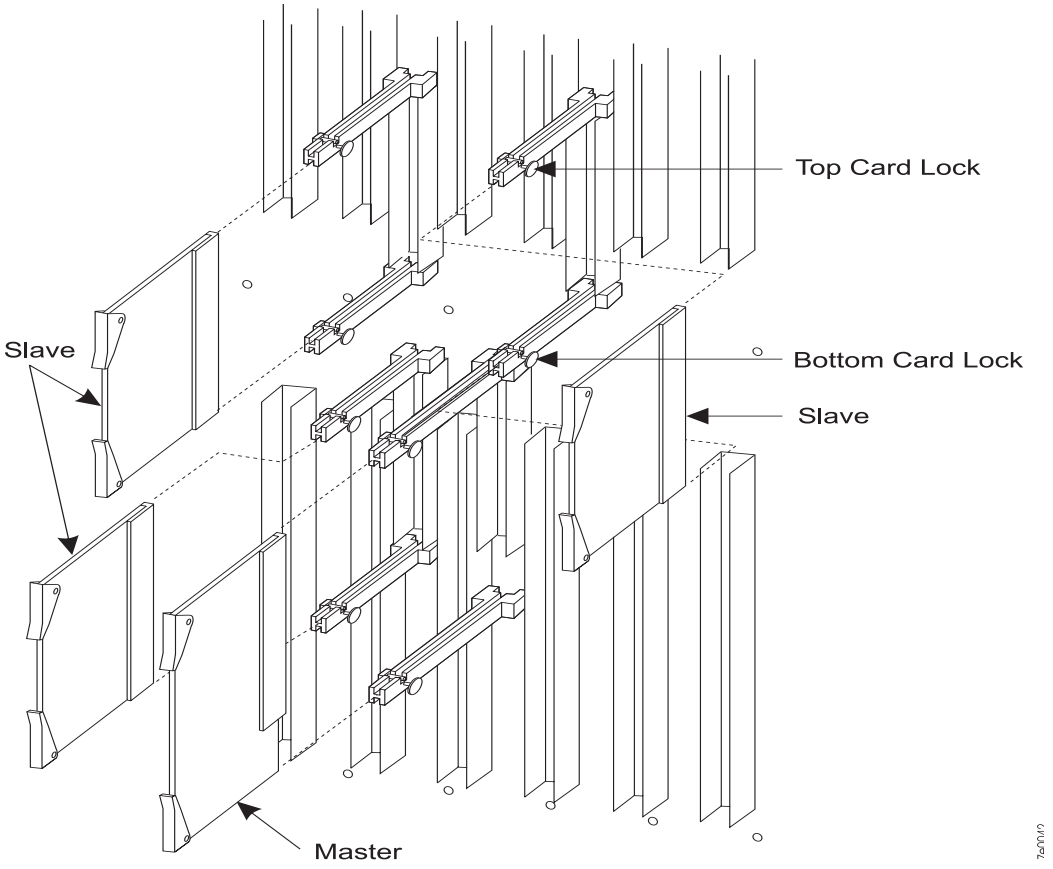


Figure 3-1 F9112 Master and Slave Circuit Card Locations

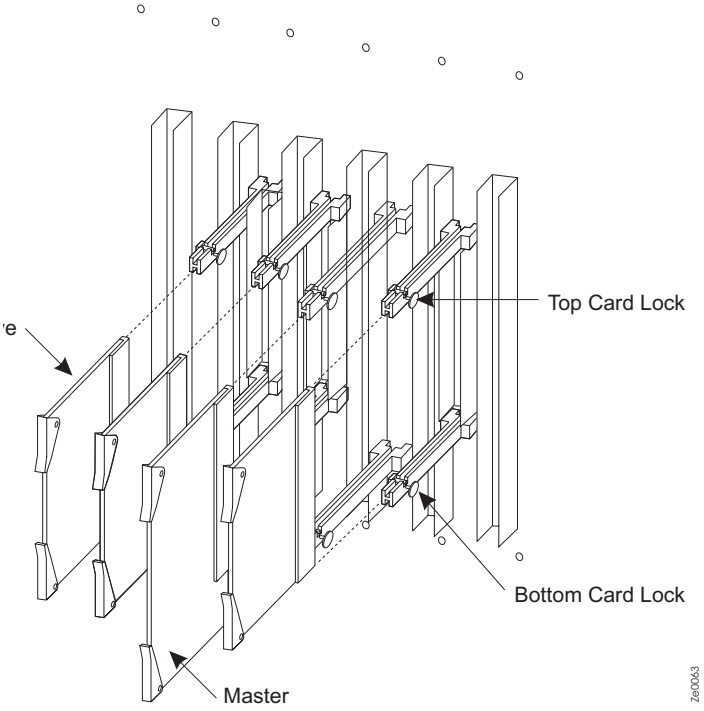


Figure 3-2 F9106 Master and Slave Circuit Card Locations

Use the following procedure to remove the master and slave switch cards from the USD-X:

Tools Required: A medium straight slot screwdriver is required for this procedure.

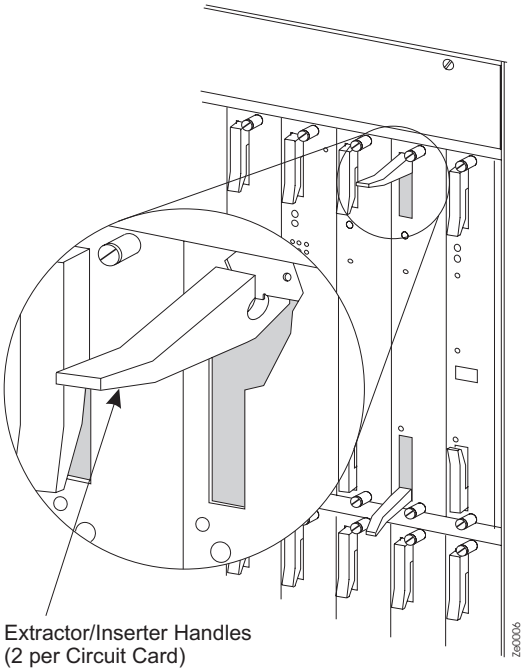
1. Use the following command string on all application processors:

```
sync;sync;sync;halt
```

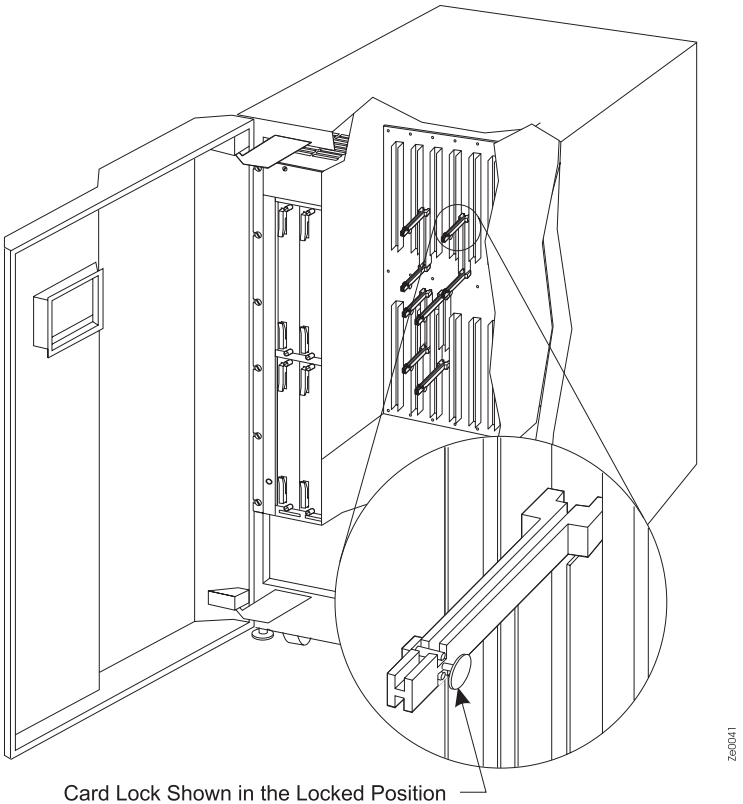
ATTENTION! Shutdown must be done on all application processors prior to removing power.

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Turn the power off by using the Power switch (see power supplies located on the front of the USD-X). Also, turn all switches to off (0). These switches are located on the back of the USD-X.
3. To access the master and slave switch cards, the cards in slots 2, 3, 4, 8, 9, and 10 may need to be removed. First, make a note of where the circuit cards and cables are located. Then use the medium screwdriver and remove the top and bottom screws holding the circuit cards in slots 2, 3, 4, 8, 9, and 10 from the front of the USD-X.
4. Finish by using both the top and bottom extractor inserter handles to remove the circuit cards.



5. Locate the top and bottom card locks on each master or slave switch card you are removing.



6. Carefully slide both the top and bottom card locks to the unlock position.
7. Using equal pressure on each of the extractor/inserter handles, remove the switch card(s).
8. Place the switch card(s) into an anti-static bag.

The USD-X requires the switch card(s) for operation, therefore, continue with the next section "Master and Slave Switch Card Installation Procedure".

Master and Slave Switch Card Installation Procedure

Use the following procedure to install the master and slave switch cards in the USD-X:

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Position the switch card in the correct slot location and gently slide it in until it is approximately 1 inch from the extractor/inserter handles.
2. Use the extractor/inserter handles to insert the switch card into place.
3. Slide the card locks to the lock position.
4. Install the circuit cards and cables removed previously and use the small straight slot screwdriver to secure the cards and cable connectors in place.
5. Power on the system using the "Power On" procedure.

Midplane Fuse Removal Procedure

The USD-X contains fuses for each slot in the F9112 and F9106. These fuses are on the midplane and are accessed from the back of the system. For all fuse locations on the F9112, see Figure 3-1 and Table 3-1. For all fuse locations on the F9106, see Figure 3-2 and Table 3-2.

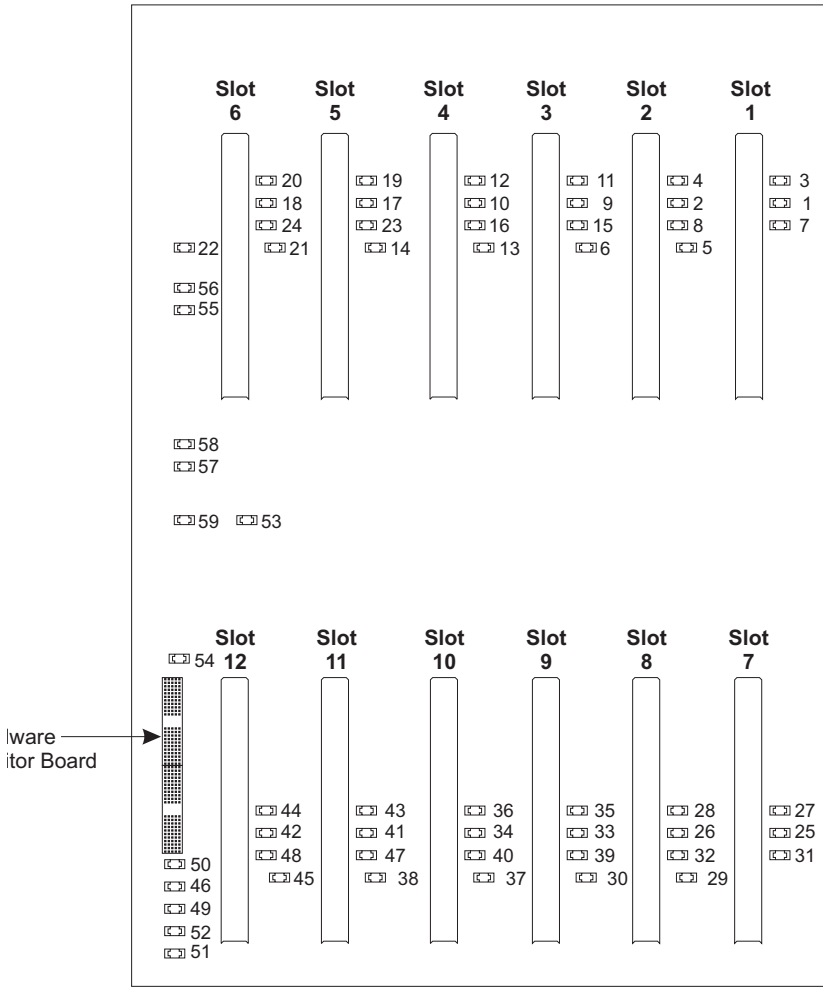


Figure 3-3 F9112 Fuse Locations

Table 3-1 Fuse Numbers Corresponding to Slots on the F9112 Midplane

Slot Number	Fuse Numbers
1	1, 3, 5, and 7
2	2, 4, 6, and 8
3	9, 11, 13, and 15
4	10, 12, 14, and 16
5	17, 19, 21, and 23
6	18, 20, 22, and 24
7	25, 27, 29, and 31
8	26, 28, 30 and 32
9	33, 35, 37, and 39
10	34, 36, 38, and 40
11	41, 43, 45, and 47
12	42, 44, 46, and 48
HMB	49, 50, 51, 52, and 54
HMB/Slave/Master	53
J1	55, 56, 57, 58, and 59

NOTE: Refer to Appendix E for the voltage for each of the fuse controls.

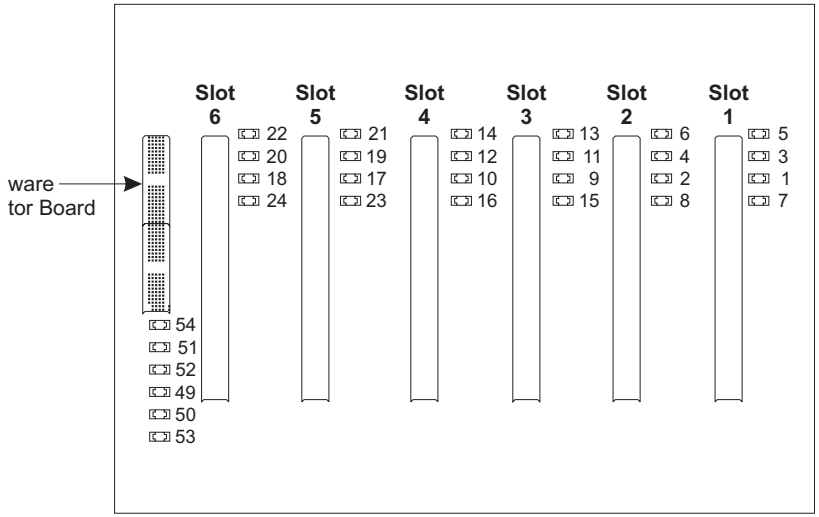


Figure 3-4 F9106 Fuse Locations

Table 3-2 Fuse Numbers Corresponding to Slots on the F9106 Midplane

Slot Number	Fuse Numbers
1	1, 3, 5, and 7
2	2, 4, 6, and 8
3	9, 11, 13, and 15
4	10, 12, 14, and 16
5	17, 19, 21, and 23
6	18, 20, 22, and 24
HMB/Slave/Master	53
HMB	49, 50, 51, 52, and 54

Use the following procedure to remove a fuse from the USD-X midplane:

NOTE: A medium straight slot screwdriver, an ohm meter, and a needle-nose pliers are required for this procedure.

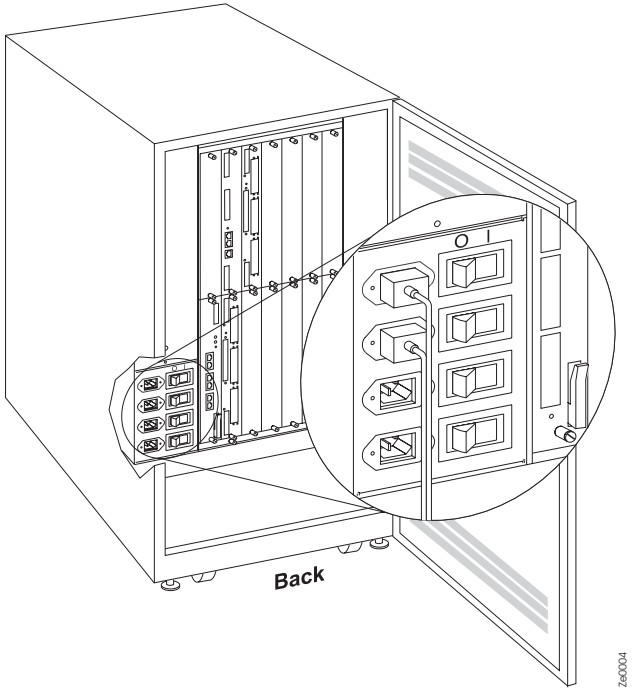
1. Use the following command string on all application processors:

```
sync;sync;sync;halt
```

ATTENTION! Shutdown must be performed on all application processors prior to removing power.

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Turn the power off by pressing the Power switch on the power supplies located on the front of the USD-X. Also, turn all switches to off (0), these are located on the back of the USD-X.



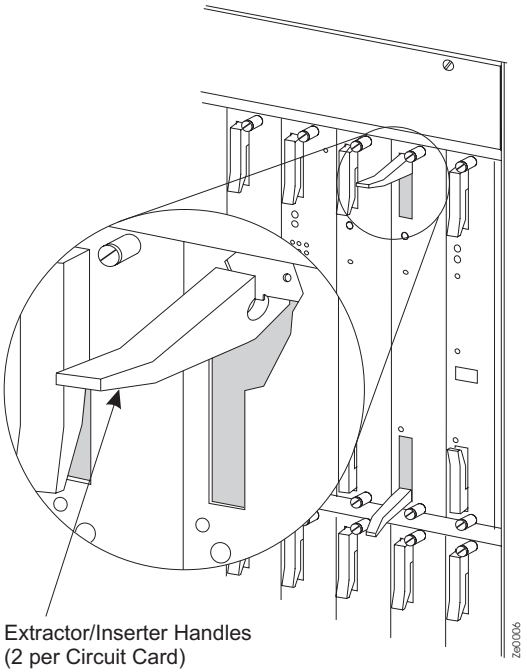
3. To access the midplane fuse (from the back of the system), remove the cards from the slot that has the blown fuse, using the following steps:

NOTE: You may need to remove additional cards to allow access to the fuse.

a. Make a note of where the circuit cards and cables are located.

b. Using the medium screwdriver, remove the top and bottom screws holding the circuit cards in the back of the USD-X.

c. Using both the top and bottom extractor inserter handles, remove the circuit cards.



4. To determine which fuse is bad, use the ohm meter, and measure the slot's fuses (Figure 3-3 or Figure 3-4). A good fuse has a reading of less than 5 ohms. A bad fuse has a reading of greater than 5 ohms.

5. Using the needle-nose pliers, carefully grip the center of the fuse, and pull it away from the midplane.

The USD-X requires the fuse(s) for operation; therefore, continue with the next section "Midplane Fuse Installation Procedure."

Midplane Fuse Installation Procedure

Use the following procedure to install the midplane fuse(s) into the USD-X:

Tools Required: A medium straight slot screwdriver and a needle-nose pliers are required for this procedure.

1. Grip the center of the new fuse with the needle-nose pliers.
2. Position the fuse and gently press it into the fuse holder.
3. Install the circuit cards and cables removed previously and use the small straight slot screwdriver to secure the cards and cable connectors in place.
4. Power on the system using the "Power On" procedure.

Fan Tray Replacement Procedure

This section contains the procedure for replacing the fan tray in the USD-X. The six fans for cooling the USD-X are located in a fan tray assembly above the USD-X circuit cards. Only McDATA-trained service personnel should replace the fan tray assembly.

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system.

1. Use the screwdriver to loosen the two screws located on the front of the fan tray assembly.

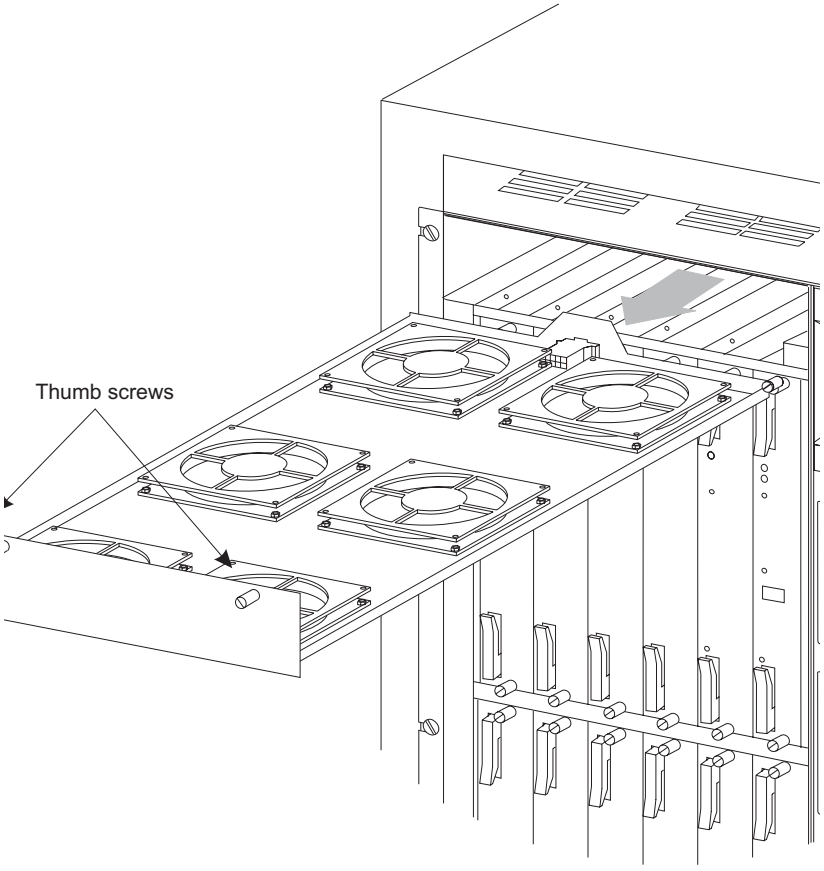
ATTENTION! To ensure that the hardware does not overheat, complete this procedure immediately.

2. Slide the fan tray assembly straight out from the chassis. As you slide the fan tray out, power is disconnected from the fan tray assembly.

CAUTION

Keep fingers away from the fan blades. The blades may continue turning after power is removed.

3. Place the fan tray in an anti-static bag and return it to the factory.
4. Remove the new fan tray assembly from its container and insert it into the fan tray slot.
5. Use the medium straight slot screwdriver to screw the new fan tray assembly into place with the two screws located on the front of the fan tray assembly.



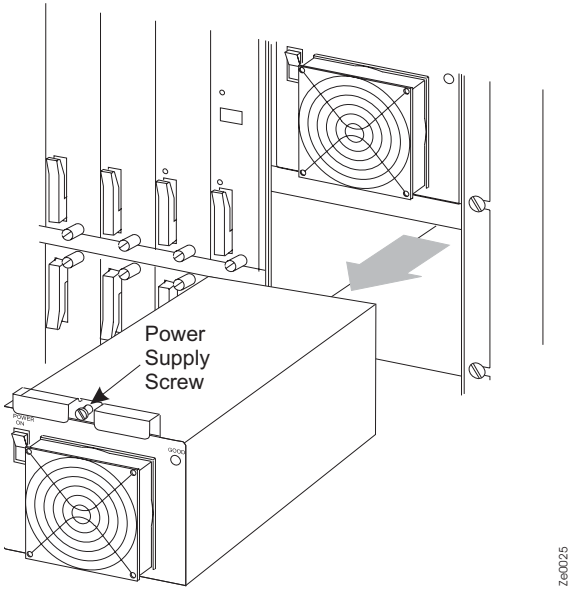
Power Supply Replacement Procedure

This section contains the procedure for replacing a power supply in the USD-X. The USD-X contains two to four power supplies depending on the system configuration. Only McDATA-trained service personnel should replace the power supply.

Tools Required: A medium straight slot screwdriver is required for this procedure.

NOTE: You do not need to remove power from the system, but be aware that power supply removal may overload the remaining power supplies.

1. Use the medium straight slot screwdriver to remove the one screw located on the front of the power supply.
2. Switch the power supply off.



3. Slide the power supply out from the chassis. As you slide the power supply out, power is disconnected.
4. Remove the new power supply from its container.
5. Place the power supply that was removed from the system into the container and return it to the factory.
6. Switch the new power supply off and insert it into the power supply slot.
7. Using the screwdriver tighten the screw located on the front of the power supply to secure the power supply in place.
8. Switch the new power supply on.
9. Clear the service LED that is located below the CD-RW or DAT drive, using the **`serv_led_chg 0`** command.

Application Processor Hard Disk Replacement Procedure

This section contains the procedures for replacing the hard disk drive on an application processor adapter in the USD-X. Only McDATA trained service personnel should replace the application processor hard disk.

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Use the following command string to shutdown the system traffic to the application processor adapter:

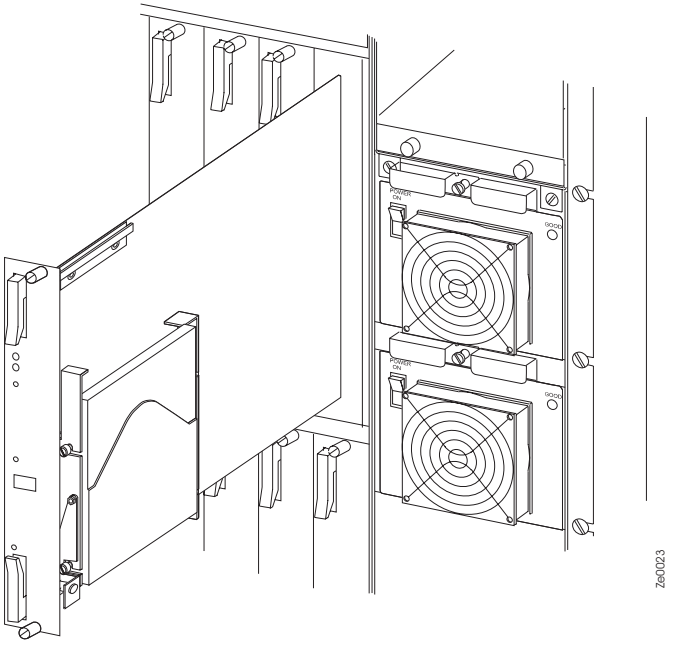
   ```
   sync;sync;sync;halt
   ```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

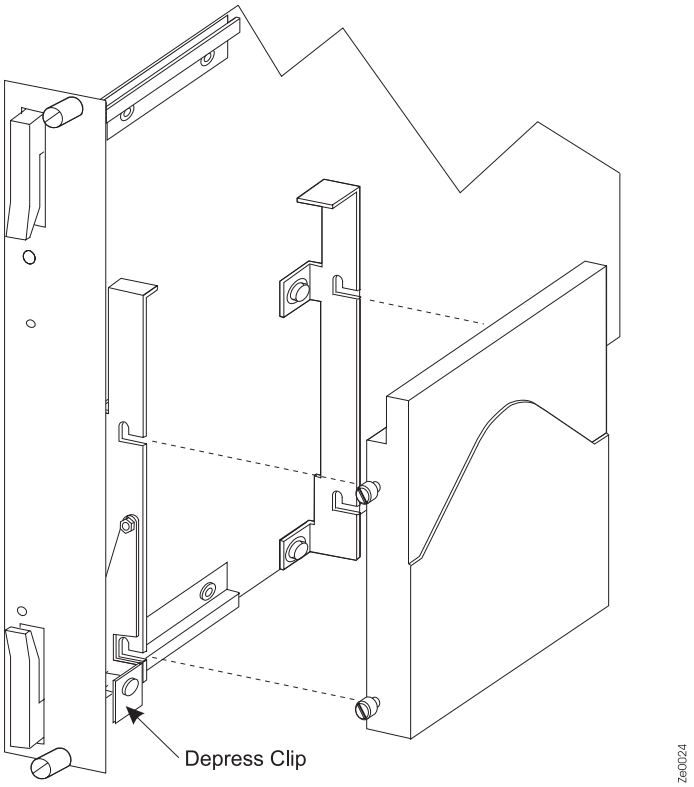
2. Using the screwdriver, loosen the top and bottom screws holding the application processor in place.

NOTE: You do not need to remove power from the system.

3. Using both the top and bottom extractor/inserter handles, slide the application processor out so that the hard disk drive can be accessed.



4. Disconnect the power and data cables to the hard disk drive.
5. Depress the clip as shown, slide the hard drive down, and pull it away from the board until it is free.



6. Place the hard disk into an anti-static bag and return it to the factory.
7. Remove the new hard disk from the anti-static bag.
8. If this is a ZSP Application Processor, match the model number with the list below and add or remove the B5 jumper from the ZSP assembly as needed. If this is a USM Application Processor continue at step 9.

NOTE: The jumper is in the kit supplied.

B5 Jumper State:	Disk Type/Model Types
On	For 50-Pin SCSI Disk (Disables on Board Termination): • IBM hard drive model DNES-309170 & DDRS-34560 • Seagate hard drive model ST39216N-9J6
Off	For 68-Pin SCSI Disk (Enables on Board Termination) • Hitachi/IBM hard drive (Ultra Star model IC35L036UWDY10-0) • Seagate hard drive (Seagate Ultra320 model ST336607LW)

9. Attach the data and power cable and then slide the new hard drive into place. If this is a USM Application Processor skip to step 11, otherwise continue at step 10.
10. If the SCSI cable and ZSP or SCSI cable and hard drive are not compatible (68-pin verses 50-pin), refer to the table below for the kits and instructions used to adapt the drive and ZSP assembly.

ZSP P/N	Hard Drive Model(s)	Instructions
20501327	• Hitachi/IBM IC35LO36UWDY10 • Seagate ST336607L	Continue at step 14 of the "Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation" (refer to page -54 of this chapter).
20501900	• IBM DNES-309170 • IBM DDRS-34560 • Seagate ST39216N-9J6	Use the SCSI cable and jumper from kit #01100605 or #01100606, which is supplied with the drive.

11. Clip the hard disk onto the application processor.
12. Slide the application processor in until it is approximately 1 inch from the ejector handles.
13. Use the extractor/inserter handles to insert the circuit card into place.

14. Using the screwdriver, tighten the top and bottom screws to secure the circuit card in place.

Application Processor Hard Disk Replacement Procedure With SCSI Adapter Kit Installation

This section contains the procedures for replacing the hard disk drive on an application processor adapter in the USD-X and for installing the SCSI adapter kit.

NOTE: Only McDATA trained service personnel should replace the application processor hard disk.

SCSI Adapter Kit Contents

This section lists the contents of the SCSI adapter kit.

Table 3-3 SCSI Adapter Kit Contents

Quantity	Component
1	SCSI Adapter Board
1	SCSI Cable
1	Right Side Bracket
1	5/64 Allen Wrench
2	Allen Screws
1	Jumper

Application Processor Hard Disk Replacement and SCSI Adapter Kit Installation Procedure

Use the following procedure to replace the application processor hard disk and install the SCSI adapter kit:.

WARNING: Attach a wrist strap and follow ESD procedures during the handling of all electronic components.

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Use the following command string to shutdown the system traffic to the application processor adapter:

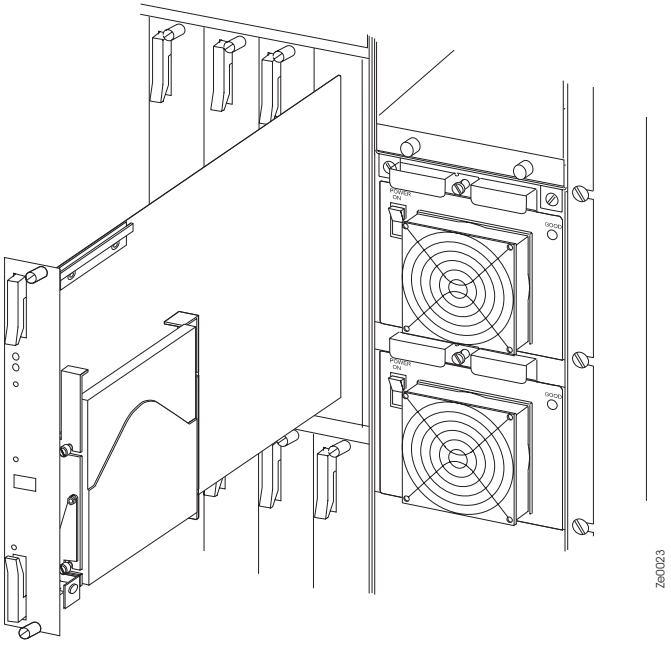
   ```
   sync;sync;sync;halt
   ```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Using the screwdriver, loosen the top and bottom screws holding the ZSPx application processor in place.

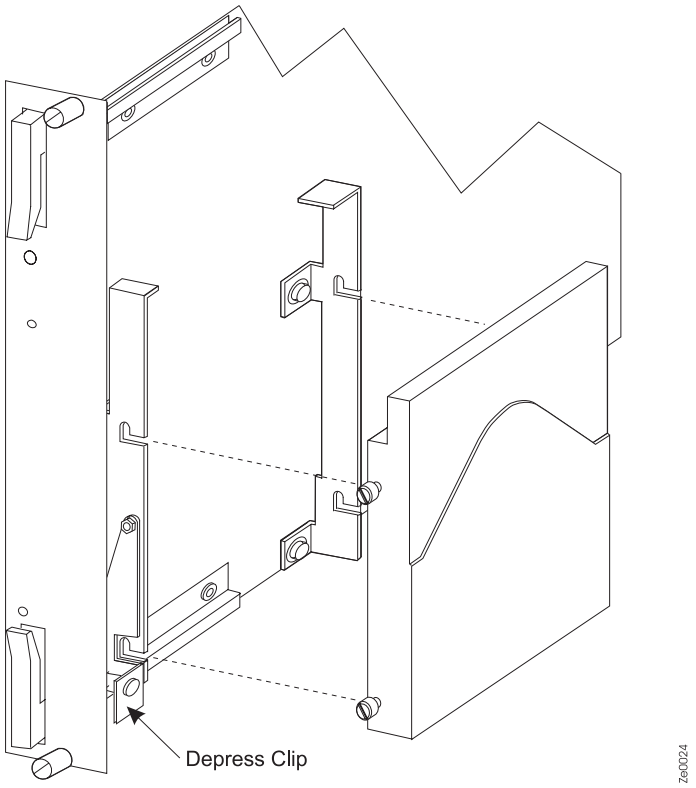
NOTE: You do not need to remove power from the system.

3. Using both the top and bottom extractor/inserter handles, slide the ZSPx application processor out so that the hard disk drive can be accessed.



4. Depress the clip as shown below, slide the hard drive down, and

pull it away from the board.



5. Disconnect the power and data cables at the PCB connectors on the ZSPx application processor.
6. Remove the hard disk from the ZSPx application processor. Save the power cable.
7. Place the hard disk into an anti-static bag and return it to the factory.
8. Remove the plastic ears from connector P4 on the ZSPx application processor by forcing the ears outward and pulling them straight up.
9. Remove the B5 jumper, located between the JSC2 and P4 connectors on the ZSPx application processor.
10. Remove the right side bracket (P/N 05001014) by removing the two Allen screws with the 5/64 Allen wrench provided in the kit.

11. Insert the rubber grommets in the holes of the new right side bracket (P/N 05001486) and attach it to the ZSPx application processor with two Allen screws and tighten with the wrench.
12. Remove the new hard disk drive from the anti-static bag, attach the saved power cable.
13. Install the 4 slotted shoulder screws included in the shipping box to the new hard disk.
14. Plug the SCSI adapter board from the kit into the JSC2 connector located on the ZSPx application processor. The JSC1 connector on the adapter board will rest on top of the P4 connector.
15. Plug the SCSI cable from the kit into the JSC1 connector of the SCSI adapter board with the orientation such that the ribbon cable protrudes from the top of the connector and runs over the top of the adapter board back towards the new hard disk mounting bracket.
16. Connect the ribbon cable from the SCSI adapter board to the new hard disk.
17. Slide the new hard disk into the bracket in the locked position. Connect the power cable from the hard drive to the new ZSPx application processor.
18. Slide the ZSPx application processor in until it is approximately 1 inch from the ejector handles.
19. Use the extractor/inserter handles to insert the ZSPx application processor into place.
20. Using the screwdriver, tighten the top and bottom screws to secure the ZSPx application processor in place.

CD-RW Drive Replacement Procedure

This section contains the procedures to follow when replacing a CD-RW Drive. Only McDATA trained service personnel should remove or install the CD-RW drive.

Tools Required: A medium straight slot screwdriver and a small Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

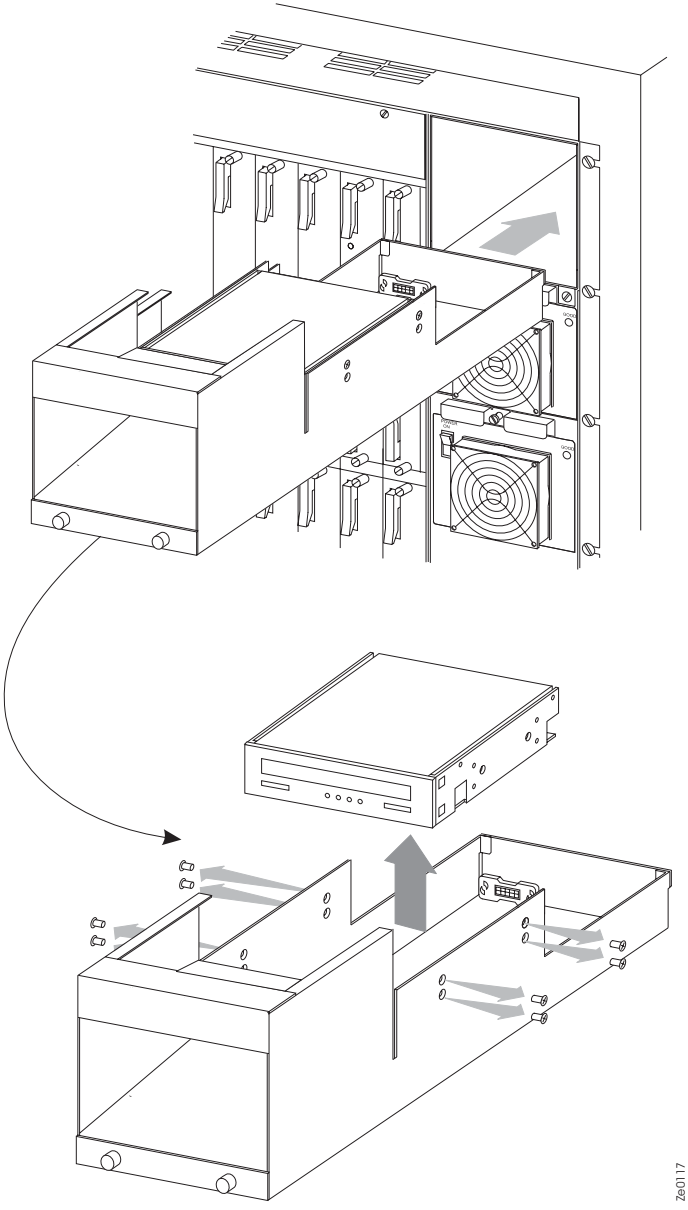
1. Use the following command string to shutdown the Primary Service Monitor:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Use the straight slot screwdriver to unscrew the two screws located on the front of the auxiliary drive chassis.
3. Slide the auxiliary drive chassis out from the USD-X as shown in the figure on the next page. When you slide out the auxiliary drive chassis, power is disconnected.

NOTE: Use care when sliding the auxiliary drive chassis out, since the data cable and power cable are still connected. The data cable is fixed to the USD-X and must be disconnected before the auxiliary drive chassis can be moved away from the chassis.



4. Remove the data and power cables from the back of the CD-RW drive.

5. Using the Phillips screwdriver, remove the 8 screws from the sides (4 screws per side) of the auxiliary drive chassis.
6. Remove the CD-RW drive from the auxiliary drive chassis as shown in the figure on the previous picture.
7. Place the CD-RW drive in an anti-static bag and return it to the factory.
8. Remove the new CD-RW drive from its container and, while carefully moving the cables out of the way, insert it into the auxiliary drive chassis. .
9. Using the Phillips screwdriver, secure the CD-RW drive to the auxiliary drive chassis with the screws removed in step 5.
10. Connect the data and power cables.
11. Slide the auxiliary drive chassis into the USD-X.
12. Using the medium straight slot screwdriver, fasten the auxiliary drive chassis in place with the screws located on the front of the auxiliary drive chassis.
13. Boot the application processor connected to the CD-RW drive with the **`boot -r`** command. This causes the application processor to reprobe for all attached hardware devices.

DAT Drive Replacement Procedure

This section contains the procedures to follow when replacing a Digital Audio Tape (DAT) drive.

Tools Required: A medium straight slot screwdriver and a small Phillips screwdriver are required for this procedure.

NOTE: You do not need to remove power from the system.

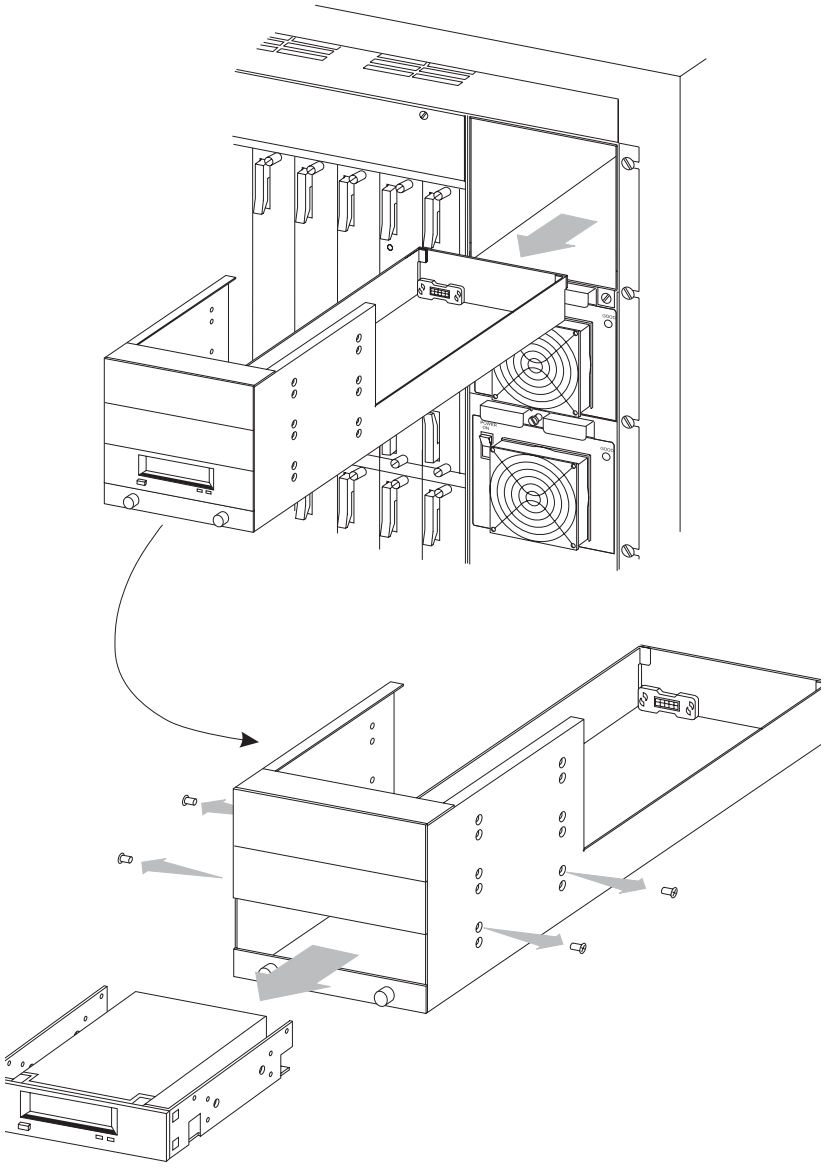
1. Use the following command string to shutdown the Primary Service Monitor:

```
sync;sync;sync;halt
```

NOTE: Wait for the 'OK' prompt to indicate the command has completed. Then continue with the next step.

2. Use the straight slot screwdriver to remove the two screws located on the front of the auxiliary drive chassis.
3. Slide the auxiliary drive chassis out from the USD-X as shown in the figure on the next page. When you slide out the auxiliary drive chassis, power is disconnected.

NOTE: Use care when sliding the auxiliary drive chassis out, since the data cable is still connected.



4. Remove the data cable.
5. Using the Phillips screwdriver, remove the 4 screws from the side of the auxiliary drive chassis.
6. Remove the DAT drive from the auxiliary drive chassis.

7. Place the DAT drive in an anti-static bag and return it to the factory.
8. Remove the new DAT drive from its container and, while carefully moving the cables out of the way, insert it into the auxiliary drive chassis.
9. Using the Phillips screwdriver, secure the DAT drive to the auxiliary drive chassis with the screws removed in step 5.
10. Replace the data cable.
11. Slide the auxiliary drive chassis into the USD-X.
12. Using the medium straight slot screwdriver, fasten the auxiliary drive chassis into place with the screws located on the front of the auxiliary drive chassis.
13. Boot the application processor connected to the DAT drive with the **`boot -r`** command. This causes the application processor to reprobe for all attached hardware devices.

Chapter 6, Using the Tape Utility for Backups and Restores, provides the procedures for performing full and incremental backups using the Tape Utility.

Application Processor Backup and Restore Procedures for a DAT Drive

The application processor backup and restore procedures in this section describe how to backup and restore the configuration created and saved by the Graphical Configuration Interface to the DAT tape drive. Backup and restores should be part of routine maintenance procedures, use the backup and restore utility to run complete backups and restores.

Configuration Backup Procedure for a DAT Drive

This procedure defines how to backup USD configurations created and saved with the GCI to tape using the *tar* command. The configurations are stored in a subdirectory named for the configuration, which is located in the */cnt/configs/offline* directory. This procedure describes a method using full path names for backup, which also applies to any subsequent restores.

1. Login as root.
2. Install a DAT tape that is **not** write locked.
3. To backup all the configurations enter this command:

```
tar -cvf /dev/rmt/0 /cnt/configs/offline
```

4. To backup a specific configuration enter this command:

```
tar -cvf /dev/rmt/0
/cnt/configs/offline/name-of-config
```

5. Press the button on the tape drive to eject the tape after the command has completed.
6. Logout.

Configuration Restore Procedure for a DAT Drive

This procedure defines how to restore USD configurations that were backed up to tape with the *tar* command. The configurations are stored in a subdirectory named for the configuration under the directory */cnt/configs/offline*.

1. Login as root.
2. Install a DAT tape.
3. To restore all the configurations on the tape enter this command:

```
tar -xvf /dev/rmt/0
```

4. To restore a specific configuration enter this command:

```
tar -xvf /dev/rmt/0
/cnt/configs/offline/name-of-config
```

5. Press the button on the tape drive to eject the tape after the command has completed.
6. Logout.

Resetting a SPARC Application Processor

This section provides information on resetting and shutting down a SPARC application processor during normal operation.

Shut Down Solaris

Use the following procedure to shut down the operating system on a SPARC application processor:

1. Log on to a SPARC application processor through the console. The console is normally only reachable through the serial switch.
2. Issue this command string:

```
sync;sync;sync;halt
```

As Solaris shuts down, a number of messages appear on the console. The last message is `ok` on a line by itself. This is known as the Openboot prompt, or the "ok" prompt. When this prompt is displayed, it is safe to reset or power down the application processor, as described in the following section.

If for some reason an application processor is unresponsive or does not accept a connection, performing a shut down is impossible. At this point, you must reset the processor without first shutting down Solaris. You must rely upon the error recovery systems to recover or repair the file systems.

Reset a SPARC Application Processor

To reset a SPARC application processor, first shut down its operating system (as described in the previous section). After shutting down Solaris, use either of these methods to reset an application processor:

- Push the Reset button on the front panel of the card.
- Log on to the Service Monitor and issue a **`slot_reset`** command. The argument to the command is the slot number (1–12) to be reset. For example, to reset slot 7, issue the following command on the Service Monitor processor:

```
slot_reset 7
```

NOTE: This command does not work if the Hardware Monitor Board (HMB) hardware is missing or inoperable; or if the operating system (Solaris) is still running on the application processor that you are trying to reset. If Solaris is still running when the **`slot_reset`** command is issued, an error message is received. If it is absolutely necessary to reset a running application processor, the reset can be forced by using the *"-f"* option with the **`slot_reset`** command as a last resort.

Reset the Service Monitor

To reset the Service Monitor, first shut down its operating system (as described in the section "Shut Down Solaris" in this chapter). Then issue a **`reboot`** command to the Service Monitor.

If the Service Monitor is inoperable or unresponsive, then another application processor in the same USD-X has become a replacement Service Monitor, and you can use that application processor to issue a **`slot_reset`** command to the unresponsive Service Monitor.

Resetting an ESCON Adapter

No card preparation is needed. To reset an ESCON adapter, perform either of these actions:

- Press the Reset button on the front panel of the card.
- Issue the **`slot_reset`** command.

  The argument to the command is the slot number (1–12) to be reset. For example, to reset slot 7, issue the following command on the Service Monitor processor:

```
slot_reset 7
```

Resetting a PowerPC Processor

To reset a PowerPC processor, perform either of these actions:

- Press the Reset button on the front panel of the card.
- Issue the **`slot_reset`** command.

  The argument to the command is the slot number (1–12) to be reset. For example, to reset slot 7, issue the following command on the Service Monitor processor:

```
slot_reset 7
```

Removing Power to a USD-X

To power down a USD-X, use the procedures described in the section "Shut Down Solaris," in this chapter. This places each SPARC application processor at the `ok` prompt. All application processors must be waiting at the `ok` prompt when the box is turned off or when the last working power supply is removed.

```
     Choose a value to change, or Q to quit
->
```

The following explains the fields displayed:

`Type of Config`	`1X` — Single processor system.

	2X — Two-processor system.
`Administrator's E-mail`	E-mail address of a system administrator. Status information is automatically sent to this account.
`Local Host`	The host name of the local system (automatically loaded).

NOTE: The `Remote Host` and `Cron Type` fields that follow only pertain to USD-X chassis, which use a DAT drive for backups and restores. The CD-RW drive cannot be used to perform incremental backups.

`Remote Host`	The host name of the remote system. If specified, these utilities perform dumps from this system and puts them on the tape with the dumps from the local host.
`Cron Type`	Allows a "cron" (chronological) entry to be set up on a daily, biweekly, weekly, or monthly interval. Once this is set up, the system performs automatic incremental dumps for the interval you select. There must be a tape in the drive for this operation to occur. The cron-initiated incremental dumps do *not* write over a tape that has a full dump on it.

3. Enter or update any of the parameters shown, following the directions displayed on the screen. Once you set the Cron Type parameter, the system performs automatic incremental backups as described above.
4. Type **Q** to quit the Current Configuration Settings menu, then type **Q** again to quit the Main Menu.

Serial Number Information

A serial number appears on the front and back of each USD-X chassis, in the lower left corner. If you need to display this number on your screen, use the following procedure.

Displaying a USD-X Serial Number

To display the serial number of a USD-X, log on as **root**, and issue this command:

```
$ /usr/sbin/serial_number
```

Adjusting the USD-X Clock

This section provides clock adjustment procedures for the USD-X. Use the "Minor Clock Adjustments" section to make adjustments under 15 minutes plus or minus, this adjustment is made in operation mode. Use the "Major Clock Adjustments" section to make adjustments 15 minutes or greater plus or minus, this adjustment is made in single user mode.

Minor Clock Adjustments

Make minor adjustments [anything under 15 minutes (900 seconds) either way] to the clock by using the *date -a [-]sss* (a UNIX command). The command is as follows:

```
date -a [-]sss
```

where:

[-] sss	Equals the time (plus or minus) in seconds, needed to adjust the clock.

Major Clock Adjustments

To make a major adjustment [any adjustment greater than plus or minus 15 minutes (900 seconds)] to the SPARC clock, you must first bring the system down to a single-user mode (the maintenance mode). Make the corrections and then bring the system back up to operational status.

Use the following procedure to put the system into single-user mode.

1. Log on through the console. The console is normally only reachable through the serial switch.
2. To halt processing, type in this command:

   ```
   sync;sync;sync;halt
   ```

   The screen indicates that the program has terminated and returns an **ok** system prompt.

3. To reset the SPARC and initialize the single user mode, type in this command:

   ```
   sysprompt>boot -s
   ```

4. Once the SPARC is initialized, login by using the root password. You will see the following command:

   ```
   INIT: SINGLE USER MODE
   ```

   Type CTRL+D to proceed with normal startup (or enter the root password for system maintenance):

5. Once you are logged in, type in the following command sequence to adjust the date and time:

   ```
   sysprompt>date 0113090199
   sysprompt>date
   sysprompt>exit
   ```

   where:

01	month
13	day
09	hour (on a twenty-four hour clock)
01	minute

99	year
`date`	verifies the date
`exit`	resumes normal bootup process

You can login to the console when the system comes up.

4

Installing and Using WebView

This chapter provides the necessary information to obtain, install, and use the UltraNet WebView software on the USD-X platform. Additionally, it provides the browser and system requirements for installation. UltraNet WebView is an optional application that is browser-based, which allows the user to monitor the chassis and network remotely from any global location.

Overview

UltraNet WebView is McDATA's browser-based monitoring application for the UltraNet product family. It provides the ability to monitor SNMP interface statistics and the status of the chassis for individual nodes in an UltraNet storage network.

UltraNet WebView provides McDATA node monitoring capabilities from any location in the world that has an internet connection and which offers security access to that node. It uses browser-based access to Java applications through serial or Ethernet interfaces.

Obtaining the UltraNet WebView Software

The UltraNet WebView software is purchased separately from the other UltraNet products. It can be obtained in a number of different ways:

- If WebView is ordered with the USD-X, it will be installed on the USD-X and the customer will receive a CD-ROM.

- If WebView is purchased after the USD-X is purchased, the software can be downloaded from McDATA's web site and the customer will receive a CD-ROM.
- Upgrades for WebView's most current release are available on McDATA's web site.

Installing WebView

The following sections provide the necessary procedures to install the UltraNet WebView software

Loading the RPM File

Before you can install the UltraNet WebView software, you must load the .rpm file using a PC with an FTP client. Use the following procedure to FTP the .rpm file:

1. Insert the UltraNet WebView CD in a PC with an FTP client.
2. Open the FTP Client software and login to the USD-X as "root", or by using the appropriate user ID and password.

NOTE: The FTP Client must be set for the transfer type of binary.

3. FTP the .rpm file (**`CMNTwebview-Vx.x.rpm`**) from the CD to the directory `/var/spool/pkg/`. You may use the original filename when transferring the .rpm file.

NOTE: *x.x* is the version of the WebView .rpm file that you are installing.

Installing the Software

Use the following procedure to install the software:

1. Telnet into the UltraNet Storage Director.
2. Login as "root" or by using the appropriate user ID and password.
3. Issue the following commands to install the new software:

```
cd /var/spool/pkg

rpm -U CMNTwebview-Vx.x.rpm
```

NOTE: If you have not previously installed WebView, you may need to use the "--force" option (**`rpm -U --force CMNTwebview-....rpm`**).

4. If you completed the upgrade without errors, restart the webserver.

   To restart the webserver:

   a. First issue the **`ps -e | grep sm_httpd`** command

   b. Then issue the **`kill <PID>`** command, where <*PID*> represents the process ID number.

Using the WebView Application

Once the UltraNet WebView application has been purchased and installed, you can access a node in your network by opening your internet browser and entering the IP address (or DNS name) of the USD-X in the address bar. For further help using the UltraNet WebView application, see the *UltraNet WebView Online Help*.

NOTE: Local DNS names may be stored on each client in a Window's "hosts" file.

Browser and System Requirements for WebView

UltraNet WebView has been tested on the following operating system and browser combinations:

NOTE: View the ReadMe file on the UltraNet WebView installation CD-ROM or refer to the *UltraNet Webview Online Help* for Java plug-in information, once you have accessed the UltraNet WebView application.

- Microsoft Windows 98: Microsoft Internet Explorer 5.0
- Microsoft Windows NT: Microsoft Internet Explorer 5.0, 5.5, and 6.0
- Microsoft Windows 2000: Microsoft Internet Explorer 5.0, 5.5, and 6.0

5

Using the CD-RW Utility for Backups and Restores

This chapter provides information on using the CD-RW utility that is provided for USD-X chassis, which have a CD-RW drive installed. You can use the CD-RW utility to perform various tasks such as creating backups and restoring files from CDs.

Additionally, this chapter provides the alternate UNIX procedures, which can be used in place of the CD-RW Utility menu options.

Mounting and Unmounting a CD

To prevent the unsolicited CD tray ejections that normally occur after burning and blanking CDs, the USD-X has been configured to deactivate the volume management utility. For this reason, access to the CD must be manually implemented by issuing the **`mount`** and **`umount`** UNIX commands before and after any CD related task.

Once mounted, the CD has read only access to files and directories. The following command provides file system access to the CD through the /mnt directory of the USD-X:

mount -F hsfs -o ro /dev/dsk/c0t6d0s0 /mnt

When finished accessing a CD, it is important to unmount the CD, so that the eject button functions properly. You cannot unmount from within the /mnt directory. The following command will unmount the file system:

umount /mnt

Logging on to the Utilities

Contact customer support for account and password information.

After you gain access, type **`UltraAdm`** to display the Main Menu:

```
|=========> ULTRANET SYSTEM ADMINISTRATION System <======

   b. Backup and Restore Tape Utilities.

   c. Backup and Restore CD-RW Utilities

   u. Unix TCP/IP Configuration Utilities.

   r. Reboot the UltraNet System.

   s. Shut Down the UltraNet System. (Before power off.)

   d. Display Snap Shot of the UltraNet System.

   a. Analyze System Crash Dump Files.

   t. TOP - Real time UNIX Performance Utility.

   q. Quit

          Choose from above ->
```

CD-RW Utility Main Menu

The CD-RW Utilities can be called directly by running **`cdr_utils`** or through UltraAdm. After you log on to UltraAdm, type **`C`** from the main menu to display the CD-RW Utility Main Menu:

```
|=========> ULTRANET SYSTEM CD-RW UTILITIES <==========|

        B. Blank a CD-RW media?

        L. List CD Contents

        M. Make a Complete Backup?

        R. Restore from CD?

        Q. Quit

Choose from above ->
```

Descriptions of these options are provided in the sections that follow.

Blank a CD-RW Media

The CD-RW drive can only record data to blank CD-R and CD-RW disks. CD-R disks may only be written once and CD-RW disks may be re-written once erased. This option initiates the blanking process as a background task.

NOTE: It may take up to 40 minutes to erase a CD-RW disk.

Use the following procedure to blank a CD-RW disk:

1. Insert the CD-RW that you want to erase into the drive.
2. From the CD-RW Utilities Main Menu, type **B**.

   The following screen appears:

```
|=========> ULTRANET SYSTEM CD-RW UTILITIES <==========|

Blank a CD-RW media

NOTICE: A rewritable CD is required for this operation
to complete successfully.  All existing data on the CD
will be lost when completed.  This operation may take
up to 40 minutes to complete. Please Insert the disk
in the CD drive and close the tray.

Continue?(Y/N)
```

3. Type **Y** to erase the contents of the CD-RW. Type **N** to cancel the operation and return to the CD-RW Utility Main Menu.

   Output similar to the following is displayed after typing **Y**:

```
[Y] Blanking CD in progress...
Initializing device...done.
Blanking the media (Can take several minutes)...done.

Press any key to continue...
```

UNIX Procedure

Use this alternate procedure to blank a CD-RW by issuing UNIX commands in a telnet session:

1. Login to the telnet session as root.
2. Insert a CD-RW into the drive.
3. Enter the **`cdrw -b all`** command at the prompt to blank the CD-RW.
4. Logout.

List CD Contents

From the CD-RW Utility Main Menu, type **L** to list the contents of the CD.

UNIX Procedure

Use this alternate procedure to list the contents for a CD by issuing UNIX commands in a telnet session:

NOTE: Verify that there is a CD in the drive. When a valid backup CD is in the drive, it can be navigated and read from like a regular UNIX directory.

1. Login to the telnet session as root.
2. Insert a valid restore CD into the drive.
3. Mount the CD using this command:

   ```
   mount -F hsfs -o ro /dev/dsk/c0t6d0s0 /mnt
   ```

4. List the CD contents using this command:

   ```
   ls -Al /mnt
   ```

5. Unmount the CD using this command:

   ```
   umount /mnt
   ```

6. Logout.

Performing a Complete Backup

From the CD-RW Utility Main Menu, type **M** to make a complete backup. All files and directories in the /cnt sub-directory are copied to the CD. The following screen appears:

NOTE: The CD-RW drive can only record to blank CD-R and CD-RW disks.

```
|=========> ULTRANET SYSTEM CD-RW UTILITIES <==========|

Make a Complete Backup

NOTICE: A blank writable CD is required for this
operation to complete successfully.  All data from the
CNT directory will be copied to the disk upon completion.
This operation may take up to 10 minutes to complete.
Please Insert a blank disk and close the tray.

Continue?(Y/N) -> [Y] Backup in progress...
Initializing device...done.
Writing track 1...done.
Finalizing (Can take up to 4 minutes)...done.

Press any key to continue...
```

UNIX Procedure

Use this alternate procedure to perform a CD backup by issuing UNIX commands in a telnet session:

1. Login to the telnet session as root.
2. Insert a blank CD-R or CD-RW into the drive.
3. Create a file system using this command:

   ```
   mkisofs -o /temp_img -log-file /temp_log -r /cnt
   ```

4. Copy the file system to the CD using this command:

   ```
   cdrw -i /temp_img
   ```

5. Remove the temp files using this command:

   ```
   rm /temp_img /temp_log
   ```

6. Logout.

Performing Restore Operations from a CD

From the CD-RW Utility Main Menu, type **R** to copy all of the files and directories from the restore CD to the /cnt subdirectory. The following screen appears:

NOTE: The CD must have valid restore information. The USD-X must be rebooted for the restore to take effect.

```
|=========> ULTRANET SYSTEM CD-RW UTILITIES <==========|

Restore from CD

NOTICE: A CD with valid backup data is required for this
operation to complete successfully.  All data from the CD
will be copied over existing data in the CNT directory
upon completion.  A Reboot of the UltraNet System is
required for the restore to take effect. This operation
may take up to 10 minutes to complete.  Please Insert a
valid backup disk and close the tray.

Continue?(Y/N) -> [Y] Restore in progress...
Restoring: /cnt/configs...
Restoring: /cnt/etc...
Restoring: /cnt/ews...
Restoring: /cnt/snmp...

Press any key to continue...
```

UNIX Procedure

Use this alternate procedure to perform a restore by issuing UNIX commands in a telnet session:

1. Login to the telnet session as root.
2. Insert a valid restore CD into the drive.
3. Mount the CD using this command:

```
mount -F hsfs -o ro /dev/dsk/c0t6d0s0 /mnt
```

4. To restore all configurations enter the following series of commands:

```
cp -r /mnt/configs/* /cnt/configs
   cp -r /mnt/etc/* /cnt/etc
   cp -r /mnt/ews/* /cnt/ews
   cp -r /mnt/snmp/* /cnt/snmp
```

5. Unmount the CD using this command:

```
umount /mnt
```

6. Logout.

6

Using the Tape Utility for Backups and Restores

This chapter provides information on using the Tape utility that is provided for USD-X chassis, which have a DAT drive installed. You can use the Tape utility to create full or incremental backups, restore files from a tape, and set up automatic incremental backups.

Logging on to the Utilities

Contact customer support for account and password information.

After you gain access, type **`UltraAdm`** to display the Main Menu:

```
|=========> ULTRANET SYSTEM ADMINISTRATION System <=====|

   b. Backup and Restore Tape Utilities.

   c. Backup and Restore CD-RW Utilities

   u. Unix TCP/IP Configuration Utilities.

   r. Reboot the UltraNet System.

   s. Shut Down the UltraNet System. (Before power off.)

   d. Display Snap Shot of the UltraNet System.

   a. Analyze System Crash Dump Files.

   t. TOP - Real time UNIX Performance Utility.

   q. Quit

          Choose from above ->
```

Viewing Operating System Statistics

To view system statistics, type **d** at the Main Menu.

Performing Backups Using the Tape Utilities

To perform either full or incremental backups, follow the steps listed below. For information on configuring automatic incremental backups, see "Configuring Automatic Tape Backups," in this chapter.

1. After you log on to the utilities, type **B** from the Main Menu to display this menu:

```
================== CNT ULTRANET SYSTEM TAPE TOOLS =======

Current Tape Information  System Information:     sqatst7

TAPE: TAPE                Last Full Dump:         NONE
TAPE: NOT                 Last Incremental:       121597
TAPE: LABELED
                  :
Device: /dev/rmt/0           Email Addr:  NONE
                          CRON Job :   NONE

Choose selection from below:

 S)tatus  F)orward  B)ack  reW)ind  D)ump  L)ist

   R)estore  U)nload  C)onfigure  H)elp  Q)uit
---------->
```

The following explains the fields displayed:

TAPE_TYPE	Describes the tape that is currently in the drive: UFSINC1 — Incremental from a single host dump. UFSINC2 — Incremental from a two-host dump. UFSFULL1 — Full dump from a single host. UFSFULL2 — Full dump from two hosts.
DATE	The date when data was last written to the tape.
HOST	The name of the local host that copied files to this tape.
RHOST	The remote host (if any) whose files were dumped to this tape.
Device	The current tape device being used by this program.
Last Full Dump	The last date that a full dump was performed on this host.
Last Incremental	The last date that an incremental was performed on this host.
E-mail Address	Error messages are sent to this E-mail address.
CRON Job	The "cron" job interval that is currently configured.

2. Type **S** to display the status of the tape drive. You may need to select this option several times to display all the tape drive status information.
3. Type **F** to move the tape forward one "block." Depending on the size of the block, this may require several seconds.
4. Type **B** to move the tape back one block. If the tape was rewound to the beginning with the rewind option, the drive may report an error, but this error should not cause any problems.
5. Type **W** to rewind the tape.

NOTE: You can use the Forward, Back, and Rewind options on tapes that were not created by this utility.

---

6. Type **D** to dump (copy) information from the system to the current tape. The following screen appears:

```
Dump routine


  Choices are: F)ull System Dump to tape
               I)ncremental Update and Configuration File
save
               Q)uit

         Choose from above:
```

   The dump routine can perform full system dumps and incremental dumps. Both routines make a separate copy of the UNIX files that are involved with TCP/IP and USD-X configuration. This allows a USD-X configuration to be retrieved very quickly from the full or incremental dump tapes.

7. Perform either of the following:

   — Type **F** to perform a full **ufsdump** of the / and the /usr file systems.

   — Type **I** to perform an incremental dump of the / and the /usr file systems. The incremental dump determines when the last full dump was performed on this system and copies only the files that have been modified since that time.

   After the backup is complete, type **Q** to quit (exit) the utilities.

Performing Restore Operations from a Tape

To restore files from a tape, follow these steps:

1. After you log on to the utilities, type **B** from the Main Menu to display the backup and restore menu:

```
================== CNT ULTRANET SYSTEM TAPE TOOLS =======

Current Tape Information  System Information:     sqatst7

TAPE: TAPE                Last Full Dump:         NONE
TAPE: NOT                 Last Incremental:       121597
TAPE: LABELED
                  :
Device: /dev/rmt/0            Email Addr:  NONE
                          CRON Job :   NONE

Choose selection from below:

 S)tatus  F)orward  B)ack  reW)ind  D)ump  L)ist

   R)estore  U)nload  C)onfigure  H)elp  Q)uit
---------->
```

2. Type **L** to display the contents of the current tape loaded in the tape drive.

NOTE: Only tapes created with this tape utility can be viewed with the List option.

Output similar to the following appears:

```
Now reading the tape in drive /dev/rmt/01, please wait .
. . .
Checking if drive is busy, please wait . . . .
Checking if drive is busy, please wait . . . .0+1 records
in
0+1 records out
.
Size = 59


The files that will be displayed are dumped from the /
FS.
     It was dumped from system sqatst1
     The output can be directed to: S)creen or F)ile
Q)uit [F] ->
```

3. Select whether to direct the output to a screen (**S**), to a file (**F**), or whether to quit (**Q**). This allows you to save file system information to disk as well as to tape.
4. Repeat steps 2 and 3 as needed (or perform other commands such as **F** to move forward) to examine the contents of the currently-loaded tape.
5. Type **Q** to return to the Main Menu.
6. Type **R** to restore selected files from the backup tape. Output similar to the following appears:

```
Now reading the tape in drive /dev/rmt/01, please wait .
. . .
Checking if drive is busy, please wait . . . .
Checking if drive is busy, please wait . . . .0+1 records
in
0+1 records out
.
Size = 58

  This tape has data from two systems on it.
  Please choose which to restore: L)ocal or R)emote  [L]
 ->[H
```

7. Select whether to restore a local (**L**) or remote (**R**) system. The following menu appears:

```
Restore Choices:
              1. - ROOT file system. ( / )
              2. - DBOOT files system. ( /dboot )
              3. - CNT file system. ( /cnt )
              4. - CNTVAR file system ( /cntvar )
              5. - USR file system ( /usr )
              Q. - Quit
```

NOTE: The restore of an incremental tape places the contents of the data in the /tmp directory. It does not copy files to their original locations. You must move the data from the /tmp directory to the desired location or locations

The full restore of a full tape is not available through this utility. To perform a restore from a full UFSDUMP tape, boot the system from the alternate boot partition, and mount these partitions manually:

/(root), /dboot, /cnt, /cnt/var, /usr

After that, the UFSRESTORE program can be invoked manually to restore the tape.

8. Type the number that corresponds to the restore option you would like to use (1-5).
9. Type **I** to select an interactive restore operation (the "automatic" option is not yet available).
10. When the restore operation is complete, type **Q** to quit the utility.
11. Type **U** to eject the tape from the tape drive.

Configuring Automatic Tape Backups

You can set up automatic incremental backups, as follows:

1. After you log on to the utilities, type **B** from the Main Menu to display the backup and restore menu:

```
================== CNT ULTRANET SYSTEM TAPE TOOLS =======

Current Tape Information     System
Information:    sqatst7

TAPE: TAPE                   Last Full Dump:        NONE
TAPE: NOT                    Last
Incremental:      121597
TAPE: LABELED
    :
Device: /dev/rmt/0           Email Addr:  NONE
                             CRON Job :   NONE

Choose selection from below:

 S)tatus  F)orward  B)ack  reW)ind  D)ump  L)ist

   R)estore  U)nload  C)onfigure  H)elp  Q)uit
---------->
```

2. Type **C** to configure automatic tape backups. The following menu appears:

```
                Current Configuration Settings:

T)ype of Config:  1X (1X = Single Host, 2X = Two Hosts)

A)dministrator's Email : NONE

L)ocal Host: sqatst7

R)emote Host:

C)ron Type: NONE

   Choose a value to change, or Q to quit ->
```

The following explains the fields displayed:

Type of Config	1X — Single processor system. 2X — Two-processor system.
Administrator's E-mai	E-mail address of a system administrator. Status information is automatically sent to this account.
Local Host	The host name of the local system (automatically loaded).
Remote Host	The host name of the remote system. If specified, these utilities perform dumps from this system and puts them on the tape with the dumps from the local host.
Cron Type	Allows a "cron" (chronological) entry to be set up on a daily, biweekly, weekly, or monthly interval. Once this is set up, the system performs automatic incremental dumps on the interval you select. There must be a tape in the drive for this operation to occur. The cron-initiated incremental dumps do *not* write over a tape that has a full dump on it.

3. Enter or update any of the parameters shown, following the directions displayed on the screen. Once you set the Cron Type parameter, the system performs automatic incremental backups as described above.
4. Type **Q** to quit the Current Configuration Settings Menu, then type **Q** again to quit (exit) the Main Menu.

A

HMB3 Board Default Settings

This appendix provides the port and factory default settings for the HMB3 board. Additionally, it provides the configuration defaults for each of the HMB3 ports.

Port and Factory Default Settings

The HMB3 can be set to two different default configurations:

- Port Defaults
- Factory Defaults

Port defaults can be set using the recessed switches on the HMB3 panel. To set the port defaults hold the RESET DEFAULT SETTINGS switch while pressing and then releasing the HMB RESET switch. For more information on these switches refer to Table 2-2.

The **dpc** command in the Miscellaneous Configuration Menu can also be used to set the port defaults. For more information on this command refer to Appendix B in the *UltraNet Command Reference* manual.

Factory defaults are set by using the **fd** command in the Miscellaneous Configuration Menu. Factory defaults are also loaded after the program is initially burned into the Flash memory. This is done because the EEPROM is erased when loading the Flash.

Either default setting will reset the following parameters:

```
Password:                    ******
Command Mode Timeout:        30 minutes
```

NOTE: Contact McDATA Customer Support to obtain the default password.

Port defaults set the user-configurable 'port' parameters back to the default settings.

Port Defaults

Following are the port defaults for the slot01 through slot12, prippp, secppp, output1, and output2 ports:

```
Baud Rate                          38400
WordSize Parity StopBits           8N1
Flow Control                       RTS/CTS
Send Break                         no
Logoff Character                   n/a
```

Following are the port defaults for the PC Port and Modem Port:

```
Baud Rate                          38400
WordSize Parity StopBits           8N1
Flow Control                       RTS/CTS
Send Break                         no
Logoff Character                   ^P
```

Following are the port defaults for the Internal Port:

```
Baud Rate                          38400
WordSize Parity StopBits           8N1
Flow Control                       none
Send Break                         no
Logoff Character                   ^P
```

Following are the default values for the Service Monitor Port:

```
Baud Rate                          9600
WordSize Parity StopBits           8N1
Flow Control                       none
```

B

Remote Support

The UltraNet Storage Director system has two support connection possibilities, direct connection through a modem, which allows conventional dial-up access to each of the slots, and the PPP connection to the Service Monitor, or connection through the PC. This appendix provides the procedures for each of these connections. At the end of this appendix, there is a troubleshooting section that offers work arounds for situations that may arise while using the PPP connection.

Establishing a direct connection through the serial port, a dial-in through a remote modem, or a Telnet session via Ethernet provides a command line prompt that allows you to look at traces, logs, status, user interface statistics, etc., by entering the appropriate command. For information on UltraNet commands and how to use these commands, refer to the chapters on Basic commands and PowerPC commands in the *UltraNet Command Reference* manual.

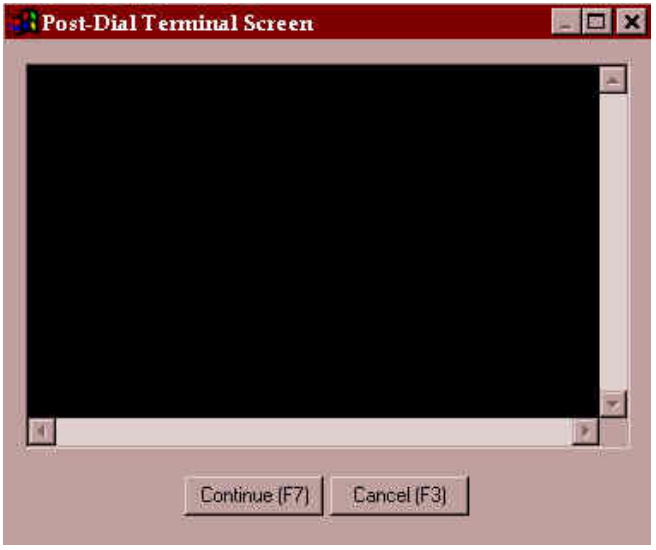
To FTP a core dump, capture files, or download configuration files, you will need to establish a PPP connection through the serial port.

Dial-In PPP Connection

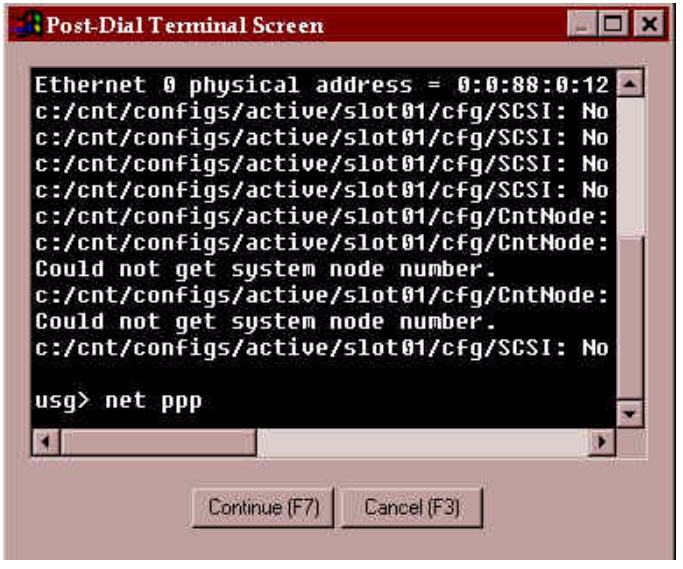
Establish a serial PPP dial-in connection using the tools provided by your Windows operating system.

NOTE: Do not enable software compression in your dial-up properties.

After you eatablish a dial-in connection, a small terminal window, as shown below, is displayed.



1. Log on to using the login you have created.
2. Type **`net ppp`**.



3. Click **Continue**. A small connection information window will open to inform you of the established connection.

NOTE: When you FTP via the PPP connection, software compression cannot be enabled.

Modem Setup

This section assumes that you are using either a Microcom DeskPorte Fast modem or a Multi-Tech MT5634ZBA modem on the USD-X end.

Microcom Modem Settings

The modem settings require both a local and remote operational setting.

Use the following command to configure the modem for local operation:

AT&F*E0\T15%C0&D0*W0

Use the following command to configure the modem for remote operation:

AT&F*E1%U1$B38400&D2\D4Q2S2=0*S42*W0

This command configures the modem such that the serial port speed is at 38400 (`$B38400`), DTR is ignored (`&D0`), remote access is enabled (`*E1`), and always keeps the current serial port speed (`%U1`).

Multi-Tech Modem Settings

The modem settings require both a local and remote operational setting.

Use the following command to configure the modem for local operation:

AT&F&D0S9=0%C0\T15&W

Use the following command to configure the modem for remote operation:

AT&F&D$SB38400&S1Q1S2=128S9=42%DC1&W

Remote Support Configurations

Remote support to a McDATA network can be established as a remote dial-in to a USD-X, then connecting to any other USD-X on the network. This configuration requires TCP/IP, see Figure A-1.

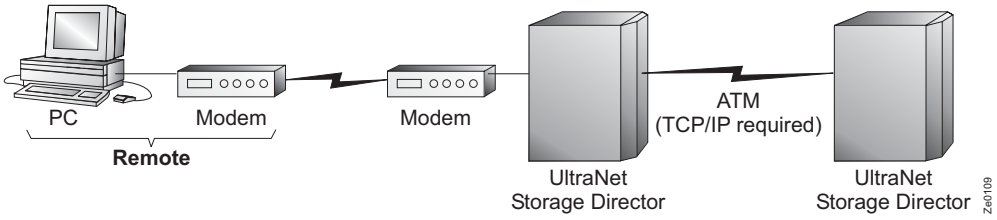


Figure B-1 USD-X to USD-X (Requires ATM Configured With TCP/IP)

C

WTI and Penril Switch Support

This appendix provides the cabling procedures and settings for the WTI and Penril switches. Additionally, the jumper settings are provided for the Hardware Monitor Adapter (HMA2).

NOTE: The information contained in this appendix is intended for McDATA Customer Support.

Cables and Adapters

Table C-1 lists the cables and adapters used for the WTI/Penril Switch.

Table C-1 WTI/Penril Cables and Adapters

Type	Description
Serial Cable Harness	This is a McDATA supplied cable harness that contains 14 RJ-45 cables. These cables connect the serial port switch to the Hardware Monitor Adapter, Primary Service Monitor, and Secondary Service Monitor (if configured).
AA Adapter	This Data Bus (DB) adapter inserts into the DTE port on the back of the remote modem for direct connection to the USD. Note: If a remote modem is being used instead of a switch, 1 AA adapter is needed. See Appendix D for information on DB adapters available from McDATA.

Table C-1 WTI/Penril Cables and Adapters (Continued)

Type	Description
DD Adapter	This DB adapter inserts into the DTE port on the back of a Penril or WTI switch for connection to a PC. See Appendix D for information on DB adapters available from McDATA.
EE adapter	This DB adapter inserts into a port on the WTI switch. Two EE adapters are used for connecting the WTI switch to the USD and one EE adapter is used for connecting the modem to the switch. Note: If a WTI switch and a modem are used, 16 EE adapters are needed. See Appendix D for DB adapters available from McDATA.
H adapter	This DB adapter inserts into the DTE port on the modem. This is used to connect a modem to a Penril or WTI switch. Also needed for the SPARC workstation. See Appendix D for DB adapters available from McDATA.
MM adapter	This DB adapter inserts into the WTI switch. This is used to connect the WTI switch to the COM 1/2 ports on the USM I/O adapter. See Appendix D for DB adapters available from McDATA.
NN adapter	This DB adapter inserts into the WTI switch. This is used to connect a WTI switch to the HMB3 board. See Appendix D for DB adapters available from McDATA.
P adapter	This DB adapter inserts into the Penril switch. This is used to connect the Penril switch to a modem. See Appendix D for DB adapters available from McDATA.

NOTE: The pinouts for the adapters are also provided in Appendix D.

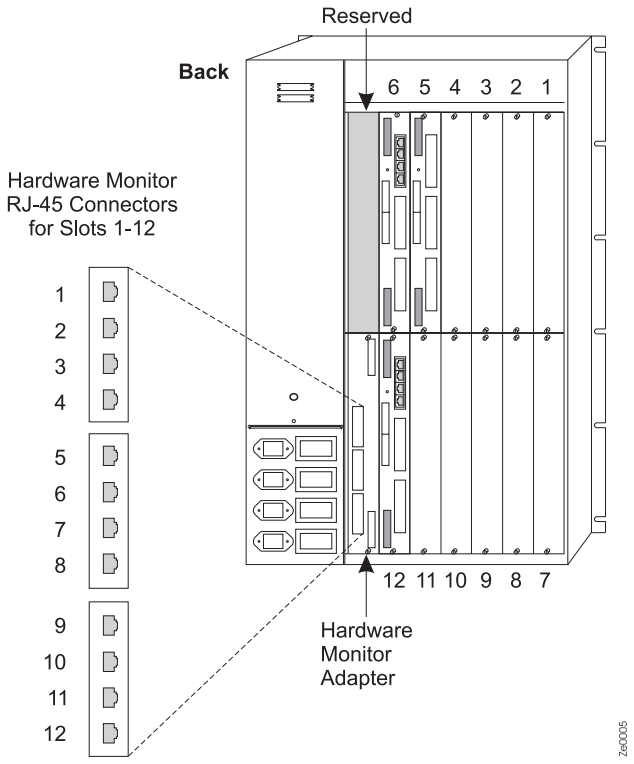
Installing the Serial Switch Cables

This section provides the procedures to install the Penril and WTI serial switch cables. The installation of the serial switch cables provides connection to all USD-X card slots, the Primary Service Monitor Serial port, and Secondary Service Monitor Serial port.

Penril Cabling

Use the following procedure to install the Penril serial switch cables:

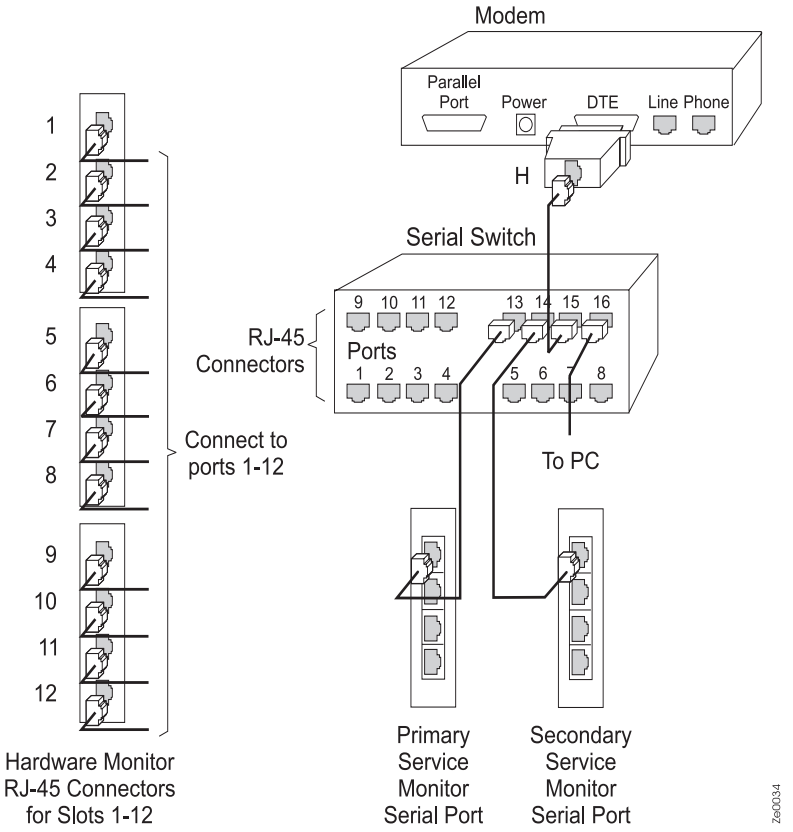
1. Locate the RJ-45 ports on the Hardware Monitor Adapter (HMAx) located in the back of the USD chassis. Each RJ-45 port corresponds to an adapter in the slot number indicated.



2. Locate the connector cable for the switch (P/N 21501273) and visually inspect the cable and its RJ-45 connectors. The connection cable for the serial switch consists of cables bundled together to allow connection of all Hardware Monitor Adapter ports, the Primary, and the Secondary Service Monitor serial ports (each connector is labeled). For information on the Primary and Secondary Service Monitors, see the "Application Processor (ZSP) Operation Overview" section in this chapter.
3. Connect the cables to the appropriately labeled port on the Hardware Monitor Adapter, Primary, and Secondary Service Monitor serial ports (as shown in the following illustration).

NOTE: If your USD-X does not have a Secondary Service Monitor, connect the cable to an available Primary Service Monitor Serial port and switch port 14.

4. Connect the other ends of the remaining cables to ports on the serial switch as shown in the following illustration.
5. If you do not have a modem, go to step 8. Connect the switch to the modem by inserting adapter H (Revision B part number 2140030) into the DTE port on the back of the modem (refer to the following illustration).



6. Insert one end of a RJ-45 cable into the connector and the other end into port 15 of the switch.
7. Connect the external phone line to the modem.

Use Appendix B to select the correct parameter settings for the modem and the Penril™ or WTI serial switches to daisy chain serial switches.

NOTE: When using the modem, follow your site's security procedures to protect access to your network.

8. Connect the serial switch power cord into the back of the serial switch and plug it into an external power receptacle. If you are installing a PC, continue with step 9; if you are not installing a PC, you are done with this procedure.
9. Connect the serial switch to the PC by inserting adapter H (revision B) into a Female-to-Female Null modem connector. Connect the Null modem to the DB-25 serial connector on the back of your PC. If your PC has a DB-9 connector, you need a 25-pin to 9-pin converter (CNT DD adapter).
10. Insert one end of an RJ-45 cable (this is a customer-supplied cable) into adapter H and the other end into port 16 of the switch.

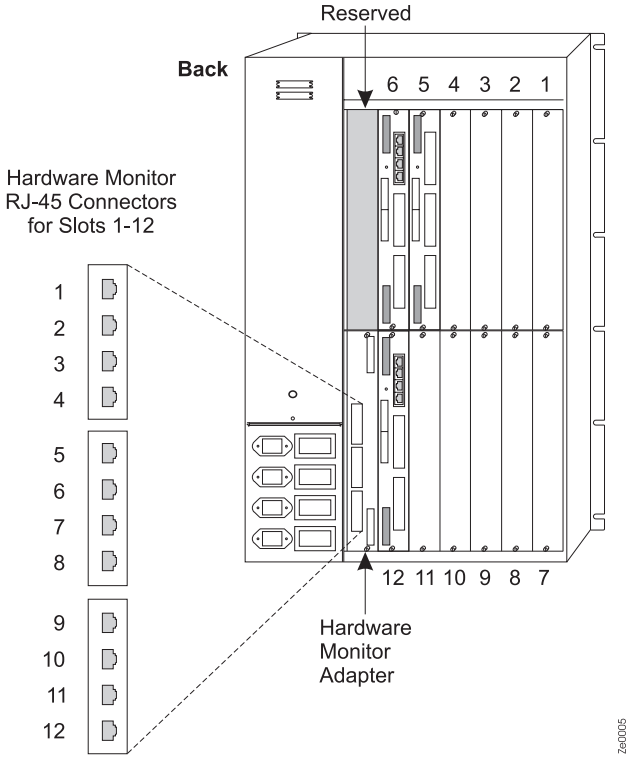
NOTE: If the serial switch you are using is a Penril™ switch, ensure port 1 on the Penril is cabled to port 1 on the HMA. Also, when a Penril switch is used, you must remove the B1 jumper on the HMA. To locate the jumper, refer to the "Hardware Monitor Adapter Jumper Settings"later in this appendix (Note that the B1 jumper is removed at the factory prior to shipping).

If using a Microcom modem, note that the battery lasts for 30 days without AC applied. If the battery completely discharges, the modem's factory settings change to the default settings. See Appendix B for proper modem settings.

WTI Serial Switch Cabling

Use the following procedure to install the WTI serial switch cables:

1. Locate the RJ-45 ports on the Hardware Monitor Adapter (HMAx) located in the back of the USD chassis. Each RJ-45 port corresponds to an adapter in the slot number indicated.

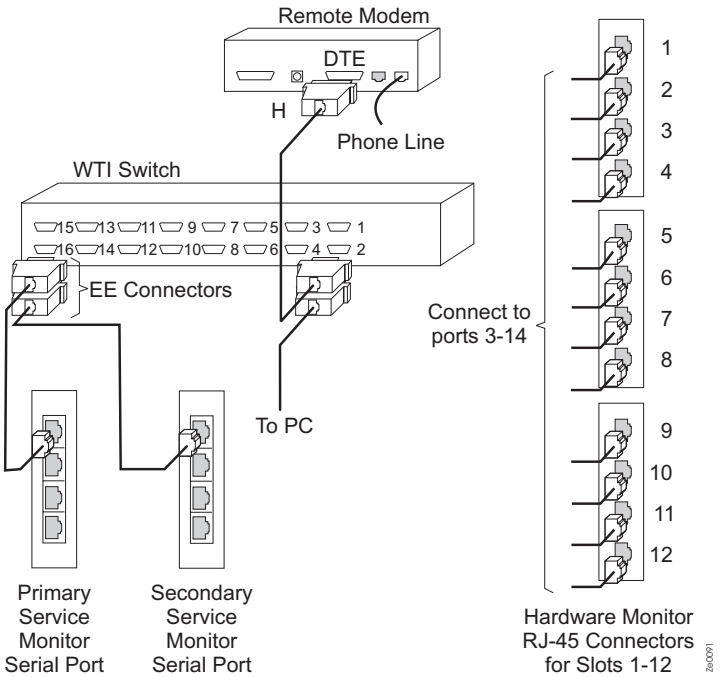


2. Locate the connector cable for the switch (P/N 21501273) and visually inspect the cable and RJ-45 connectors. The connection cable for the serial switch consists of 14 cables bundled together to allow for connection of all HMAx ports, the Primary, and the Secondary Service Monitor serial ports (each connector is labeled). For information on Primary and Secondary Service Monitors, see the section "Application Processor (ZSP) Operation Overview" in Chapter 3.
3. Install 16 EE (P/N 2149058) connectors to the ports on the WTI serial switch.
4. Connect the 14 cables to the appropriately labeled ports on the Hardware Monitor Adapter, Primary, and Secondary Service Monitor serial ports (as shown in the following illustration).

NOTE: If your USD-X does not have a Secondary Service Monitor, connect the cable to an available Primary Service Monitor serial port, and connect the other end to an EE adapter on the WTI serial switch port 14.

5. Connect the other ends of the remaining cables to the EE adapters installed on the WTI serial switch port, as shown in the following illustration.

6. If you are not connecting to a modem, go to step 9. Connect the WTI switch to the modem by inserting adapter H into the DTE port on the back of the modem as shown in the following illustration:



7. Insert one end of a RJ-45 cable (this is a customer-supplied cable) into the H adapter on the modem and the other end into port 1 of the switch.

8. Connect the external phone line to the modem.

   When using the modem, follow your site's security procedures to protect access to your network.

9. Connect the WTI serial switch power cord into the back of the switch and plug it into the external power receptacle. If you are installing a PC, continue with step 10; if you are not installing a PC, you are done with this procedure.
10. Connect the WTI serial switch to the PC by inserting a DD adapter into the PC.
11. Insert one end of a RJ-45 cable into the DD adapter and the other end into port 2 of the switch.

    If using a Microcom modem, note that the battery lasts for 30 days without AC applied. If the battery completely discharges, the modem's factory settings change to the default settings. See Appendix B for proper modem settings.

Penril™ Serial Switch Settings

The serial switch is shipped with documentation that provides complete installation and operation information. Use the following parameter settings with your USD:

Name each port you configure for a reference to the port, such as (modem, sparcsm, sparcprim, sparcsec, sparc1, escon1, escon2, etc...)

```
Starting port: 1  (any port on Penril, as long as starting and ending is the same)
Ending port: 1
Baud rate: 38400
Character length: 8 bits
Stop bits: 1 bits
Parity: None
Escape delay: No
Attachment control: Modem  (port with modem only) Unqualified (for all other ports)
Device flow control: RTS/CTS
Port flow control: RTS/CTS
Timeout (mins): 0
Timeout direction: Both
Direction: Both
Session limit: 8
Echo: CPU & VCX services
Messages: All
Confirm connections: No
Login required: No
Ignore routine bcasts: No
Detach after disconnect: Yes
BREAK key: Pass Through
Control state char: 1
```

```
Forward toggle char: 0
Backward toggle char: 0
Channel priority: 1
Disconnect delay(secs): 0
Terminal type:  13 (DEC VT-100/VT-180)
Originate access rights: 1-8
Answer access rights: 1-8
Password override: No
```

Daisy Chain Penril Configuration

Use the following illustration to daisy chain Penril serial switches:

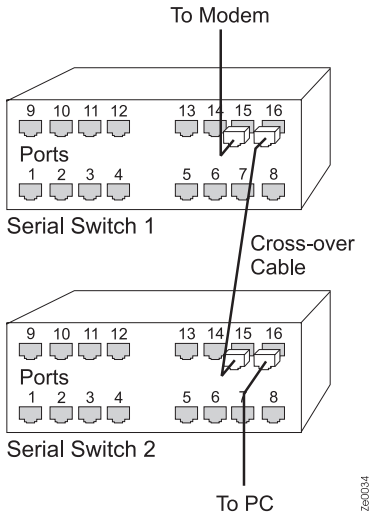


Figure C-1 Penril Daisy Chain Configuration

Western Telematic Serial Switch Settings

The WTI serial switch ships with documentation that provides complete installation and operation information.

Connector Pinouts

The WTI contains DB-9 RS-232 connections wired as follows:

Table C-2 WTI DB-9 Pinout

Pin Number	Name	Direction
1	DCD	IN
2	RXD	IN
3	TXD	OUT
4	DTR	OUT
5	GND	
6	NC	
7	RTS	OUT
8	CTS	IN
9	NC	

Configuration Parameters

Use the following parameter settings with your USD-X:

When the unit is shipped from the factory, the default settings are:

- 38400 Baud
- RTS/CTS handshaking
- Full Duplex
- 8 Bits, No Parity, 1 Stop bit

```
SYSTEM STATUS:VERSION 1.21,    Site ID: (UNDEFINED)
```

Table C-3 WTI Configuration

Port	Name	Status	Baud	COM	HS	Mode	Timeout	Buf	CTS
01	modem	Free	38.4K	8N1	RTS	modem	Off	0	L
02	PC	Free	38.4K	8N1	RTS	modem	Off	0	L
03	slot03	Free	38.4K	8N1	RTS	Pass	Off	0	L

Table C-3 WTI Configuration (Continued)

Port	Name	Status	Baud	COM	HS	Mode	Timeout	Buf	CTS
04	slot04	Free	38.4K	8N1	RTS	Pass	Off	0	L
05	slot05	Free	38.4K	8N1	RTS	Pass	Off	0	L
06	slot06	Free	38.4K	8N1	RTS	Pass	Off	0	L
07	slot07	Free	38.4K	8N1	RTS	Pass	Off	0	L
08	slot08	Free	38.4K	8N1	RTS	Pass	Off	0	L
09	slot09	Free	38.4K	8N1	RTS	Pass	Off	0	L
10	slot10	Free	38.4K	8N1	RTS	Pass	Off	0	L
11	slot11	Free	38.4K	8N1	RTS	Pass	Off	0	L
12	slot12	Free	38.4K	8N1	RTS	Pass	Off	0	L
13	prippp	Free	38.4K	8N1	RTS	Pass	Off	0	L
14	secppp	Free	38.4K	8N1	RTS	Pass	Off	0	L
15	slot01	Free	38.4K	8N1	RTS	Pass	Off	0	L
16	slot02	Free	38.4K	8N1	RTS	Pass	Off	0	L

Port 01 Parameters

```
PORT PARAMETERS  #01
1.  PORT NAME:modem
2.  PASSWORD:(undefined)
     21.    OPERATION:Wakeup Only
3.  BAUD RATE:38.4K
4.  BITS/PARITY:8-None
5.  STOP BITS:1
6.  HANDSHAKE MODE:RTS/CTS
7.  PORT MODE:Modem
     71.  RESET STRING:Hello; you have connected to the
WTI switch
     72.  INIT STRING:Please wait for the WTI password
prompt . . .
     73.  HANG-UP(undefined)
8.  COMMAND MODE:All
9.  LOGOFF CHARACTER^P
```

```
10. SEQUENCE DISCONNECTOn
11. TIMEOUT DISCONNECTOff
12. RESPONSE TYPE:Verbose
13. COMMAND ECHO:On
14. SEND BREAK:No
```

NOTE: Contact McDATA Customer Support to obtain the default password.

Port 02 Parameters

```
PORT PARAMETERS  #02
1.  PORT NAME:PC
2.  PASSWORD:(undefined)
     21.    OPERATION:Wakeup Only
3.  BAUD RATE:38.4K
4.  BITS/PARITY:8-None
5.  STOP BITS:1
6.  HANDSHAKE MODE:RTS/CTS
7.  PORT MODE:Modem
     71.  RESET STRING:Hello; you have connected to the
WTI switch
     72.  INIT STRING:Please wait for the WTI password
prompt . . .
     73.  HANG-UP(undefined)
8.  COMMAND MODE:All
9.  LOGOFF CHARACTER^P
10. SEQUENCE DISCONNECTOn
11. TIMEOUT DISCONNECTOff
12. RESPONSE TYPE:Verbose
13. COMMAND ECHO:On
14. SEND BREAK:No
```

NOTE: Contact McDATA Customer Support to obtain the default password.

Ports 03 Through 12 and 15 Through 16 Parameters

```
PORT PARAMETERS  #03
1.  PORT NAME:slot03
2.  PASSWORD:(undefined)
     21.    OPERATION:Wakeup Only
3.  BAUD RATE:38.4K
4.  BITS/PARITY:8-None
5.  STOP BITS:1
6.  HANDSHAKE MODE:RTS\CTS
7.  PORT MODE:Passive
   74.  DTR OUTPUTHigh
8.  COMMAND MODE:Basic
9.  LOGOFF CHARACTER^P
10. SEQUENCE DISCONNECTOn
11. TIMEOUT DISCONNECTOff
12. RESPONSE TYPE:Verbose
13. COMMAND ECHO:On
14. SEND BREAK:No
```

Ports 13 and 14 Parameters

```
PORT PARAMETERS  #04
1.  PORT NAME:slot03
2.  PASSWORD:(undefined)
     21.    OPERATION:Wakeup Only
3.  BAUD RATE:38.4K
4.  BITS/PARITY:8-None
5.  STOP BITS:1
6.  HANDSHAKE MODE:RTS\CTS
7.  PORT MODE:Passive
   74.  DTR OUTPUTLow
8.  COMMAND MODE:Basic
9.  LOGOFF CHARACTER^P
10. SEQUENCE DISCONNECTOn
11. TIMEOUT DISCONNECTOff
12. RESPONSE TYPE:Verbose
13. COMMAND ECHO:On
14. SEND BREAK:No
```

Daisy Chain Western Telematic Configuration

Use the following procedure to daisy chain the WTI Switch Assembly 25511247:

1. Change the Port Mode parameter of port 2 in the upstream WTI Switch from "modem" to "Any-to-Any".
2. Change the Logoff Character parameter of port 1 in the downstream WTI Switch from "^P" to "^Q". With these changes in place, the following configuration is recommended.
3. Connect the modem to port 1 of the upstream WTI Switch.
4. Connect port 2 (the PC port) of the upstream WTI Switch, using a DD adapter, to port 1 (the modem port) of the downstream WTI Switch, using a EE adapter.

Accessing the Daisy Chained WTI Switch

Use the following procedure to access the downstream daisy chained WTI Switch from the modem:

1. Dial into and awaken the upstream WTI Switch attached to the modem.
2. Enter the password for the modem port.
3. At the **APS>** prompt enter the command **/C pc**. This makes an internal connection from port 1 to port 2 on the upstream WTI Switch.

4. Awaken the downstream WTI Switch and enter the password for the modem port.
5. Connect to the port of interest, for example, **/C slot06**. Now there is a session open with the processor in slot 6, which is attached to the downstream WTI Switch.
6. When the session is complete, break the connection by typing 3 ^Qs followed by **<Enter>.** The downstream WTI Switch should respond with its **APS>** prompt.
7. Make another connection on the downstream WTI Switch or put it asleep with **/X**.
8. Break the upstream WTI Switch connection by typing 3 ^Ps followed by **<Enter>.**
9. Make another connection on the upstream WTI Switch or put it asleep and hang up the modem.

NOTE: The procedure above can be used to daisy chain another WTI Switch further downstream, but a different logoff character must be used such as "^R".

Hardware Monitor Adapter Jumper Settings

This section provides the procedures for accessing the jumpers on existing Hardware Monitor Adapters. Refer to the “Circuit Board Jumper Settings” section in Chapter 2 for the locations on the circuit board jumpers.

NOTE: The Hardware Monitor Board (HMB3) does not have any user jumper settings.

Normal connection of the Hardware Monitor Adapter (HMAx) is through a serial switch; however, a PC can directly connect to a port on the HMA instead. Install jumper B1 when a PC is directly connected to a port on the HMA. Jumper B1 is on the RS-232 serial interface card that is attached to the HMA. There are two versions of the RS-232 serial interface card, part number 20501384, and part number 20501405.

One difference between the two RS-232 serial interface cards is the orientation of jumper B1. For part number 20501384, you must remove the RS-232 serial interface card from the HMA assembly to

access jumper B1. For part number 20501405, jumper B1 is located on the top edge of the board and can be accessed without removing the RS-232 serial interface card.

How To Access Jumper B1 on a 20501405 RS-232 Serial Interface

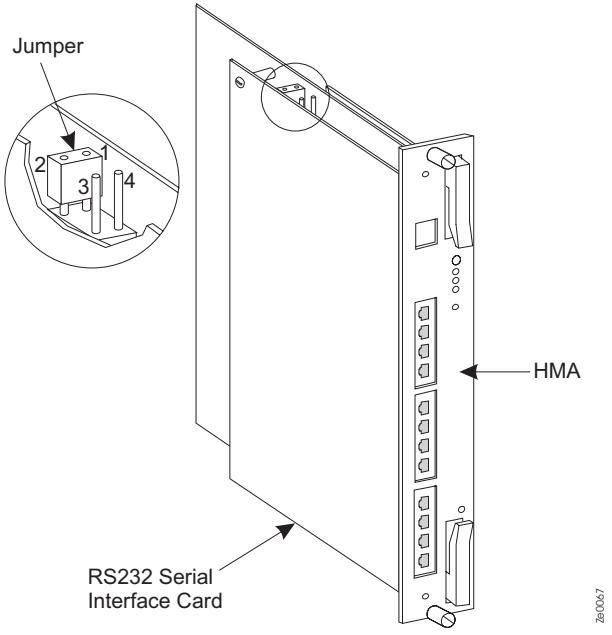
Use the following procedure to access jumper B1:

Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Remove the HMA card from the USD-X using the "Hardware Monitor Board Removal Procedure" in Chapter 3.

NOTE: The jumper B1 is located near the edge of the RS-232 serial interface card and is accessible without removing the RS-232 serial interface card from the HMA assembly.

2. Install jumper B1 between pins 1 and 2 as shown:



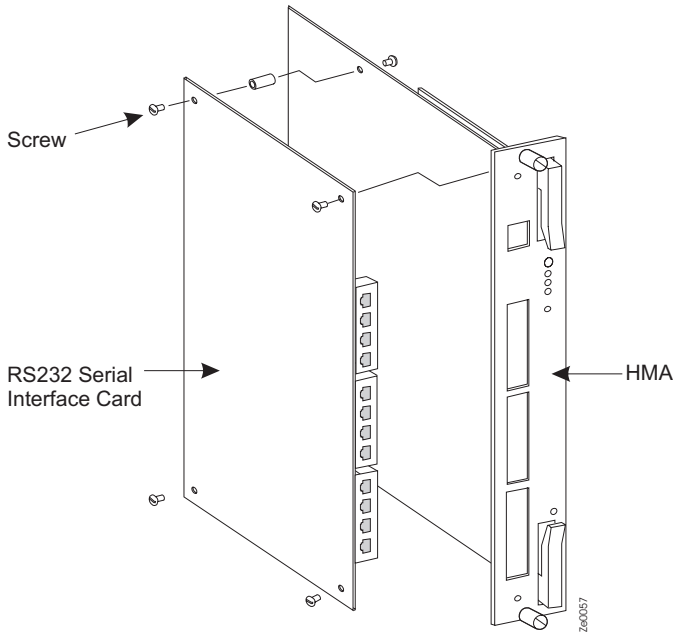
How to Access Jumper B1 on a 20501384 RS-232 Serial Interface

Use the following procedure to access jumper B1on a RS-232 serial interface part number 20501384:

NOTE: Attach a wrist strap and follow ESD procedures during the handling of all electronic components.

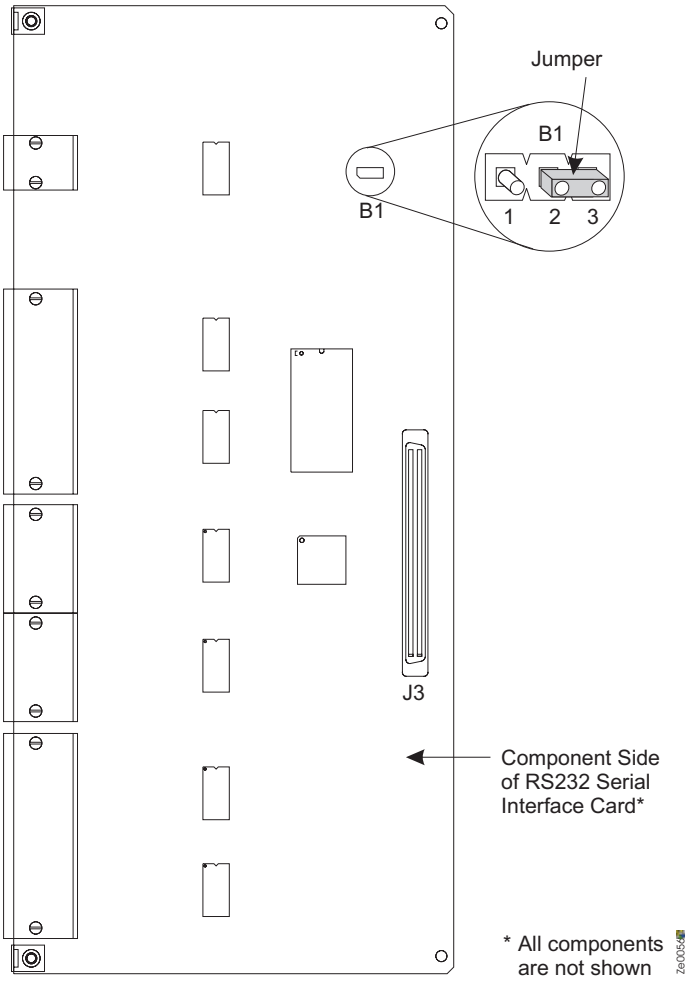
Tools Required: A medium straight slot screwdriver is required for this procedure.

1. Remove the HMA card from the USD-X using the "Hardware Monitor Board Removal Procedure" in Chapter 3.
2. Remove the 4 screws holding the RS-232 serial interface card to the HMA as shown below.



3. Gently pull the RS-232 serial interface card from the HMA's J3 connector.
4. Place the RS-232 serial interface card on top of an anti-static surface with the component side up (*see* the illustration on the next page).
5. If you are using a Penril VCX500 switch, remove the jumper at B1.

6. If you are using any other serial switch, insert a jumper on B1 pins 2-3 as shown.



Use the following procedure to reattach the RS-232 serial interface card to the HMA:

1. Align the J3 connector on the RS-232 serial interface card with the HMA and gently press the two cards together.

NOTE: Ensure that the RS-232 connectors on the RS-232 interface card align with the faceplate on the HMA.

2. Secure the RS-232 interface card to the HMA card with the 4 screws.
3. Install the HMA using the "Hardware Monitor Board Installation Procedure" in Chapter 3.

D

RJ-45 Cables and DB Adapters

This appendix lists the RS-232 cables with RJ-45 connections and Data Bus (DB) adapters available through McDATA. If you need to build DB adapters, this appendix also lists the pinouts for the adapters.

RS-232 Cables with RJ-45 Connectors

The RS-232 cable with RJ-45 connectors is used for connecting the USD-X to a LAN. Refer to Table D-1 for McDATA part numbers and lengths for the RS-232 cables.

Table D-1 RS-232 Cable with RJ-45 Connectors: Lengths and Part Numbers

Part Number	Cable Length
21500147	5 feet
21500148	10 feet
21500149	20 feet
21500150	30 feet
21500151	50 feet
21500152	100 feet

DB Adapters

This section lists the DB adapters available through McDATA. Additionally, it provides the adapter types required for USD-X applications. If you need to build your own DB adapter, this section also lists the pinouts for the DB adapters.

DB Adapters Available From McDATA

Table D-2 lists the McDATA part numbers for the RJ-45 to DB adapters. Refer to Table D-3 for information on the adapter types required for USD-X applications.

Table D-2 DB Adapter Part Numbers

DB Adapter	Part Number	Description
AA adapter	21490054 Rev A (AA)	DB25 pin
DD adapter	21490057 Rev A (DD)	DB9 pin
EE adapter	21490058 Rev A (EE)	DB9 pin
H adapter	21490030 Rev B (H)	DB25 pin
MM adapter	21490074 Rev A (MM)	DB9 pin
NN adapter	21490076 Rev A (NN)	DB9 pin
PP adapter	21490075 Rev A (PP)	DB25 pin

Required Adapters for USD-X Applications

Table D-3 lists the required adapters for USD-X applications.

Table D-3 Required Adapters for USD-X Applications

Application	Adapter(s) Required
PC to Penril Switch	DD adapter required for PC
PC to HMA2 (Hardware Monitor Adapter)	EE adapter required for PC
PC to HMB3 (Hardware Monitor Board)	DD adapter required for PC

Table D-3 Required Adapters for USD-X Applications (Continued)

Application	Adapter(s) Required
PC to WTI Switch	DD adapter required for PC, EE adapter required for WTI switch
PC to Modem	DD adapter required for PC, H adapter required for modem
Modem to Penril Switch	PP adapter required for modem
Modem to HMB3 (Hardware Monitor Board)	H adapter required for modem
Modem to WTI Switch	H adapter required for modem, EE adapter required for WTI switch
WTI to Penril	DD adapter required for WTI switch
WTI to HMA2 (Hardware Monitor Adapter)	EE adapter required for WTI switch
WTI to HMB3 (Hardware Monitor Board)	NN adapter required for WTI switch
WTI to WTI	DD adapter required for local WTI switch, EE adapter required for remote WTI switch
WTI to SBus I/O Adapter (Cosys)	EE adapter required for WTI switch
WTI to USM I/O Adapter (COM1 and COM2 ports)	MM adapter required for WTI switch

Adapter Pinouts

The sections that follow provide the pinouts for each adapter type listed. Refer to Table D-9 for the meaning of the pinout initials.

AA Adapter Pinouts

Table D-4 provides the pinouts of the AA adapter. The AA adapter is a DB25-to-RJ-45 RS-232 straight through adapter. The AA adapter is

attached to the remote modem for connection when directly attached to the USD-X.

Table D-4 AA Adapter Pinouts

RJ-45 Pin Out	DB25 Pin Out (AA Adapter)
1 DSR	6 DSR
2 DCD	8 DCD
3 DTR	20 DTR
4 GND	7 GND
5 RXD	3 RXD
6 TXD	2 TXD
7 CTS	5 CTC
8 RTS	4 RTS

DD Adapter Pinouts

Table D-5 provides the pinouts of the DD adapter. The DD adapter is a DB9-to-RJ-45 RS-232 crossover adapter. The DD adapter is used to connect the switch to a PC (DTE-to-DCE).

Table D-5 DD Adapter Pinouts

RJ-45 Pin Out	DB9 Pin Out (DD adapter)
1 DSR	6 DSR
2 DCD	1 DCD
3 DTR	4 DTR
4 GND	5 GND
5 RXD	2 RXD
6 TXD	3 TXD
7 CTS	8 CTS
8 RTS	7 RTS

EE Adapter Pinouts

Table 0-1 provides the pinouts of the EE adapter. The EE adapter is a DB9-to-RJ-45 RS-232 crossover adapter. The EE adapter is attached to the Hardware Monitor Adapter for connection with the USD-X and the remote modem. It can also be used on a PC for direct attachment to a USD-X.

Table 0-1 EE Adapter Pinouts

RJ-45 Pin Out	DB9 Pin Out (EE Adapter)
1 DSR	4 DTR
2 DCD	6 DSR
3 DTR	1 DCD
4 GND	5 GND
5 RXD	3 TXD
6 TXD	2 RXD
7 CTS	7 RTS
8 RTS	8 CTS

H Adapter Pinouts

Table 0-2 provides the pinouts of the H adapter. The H adapter is a DB25-to-RJ-45 RS-232 crossover adapter. The H adapter is inserted into the DTE port on the remote modem to connect the modem to the Hardware Monitor Board. The H adapter is also used to connect a SPARC workstation to the USD-X.

Table 0-2 H Adapter Pinouts

RJ-45 Pin Out	DB25 Pin Out (H Adapter)
1 DTR	20 DTR
2 DCD	8 DCD
3 DSR	6 DSR
4 GND	7 GND

Table 0-2 H Adapter Pinouts (Continued)

RJ-45 Pin Out	DB25 Pin Out (H Adapter)
5 TXD	2 TXD
6 RXD	3 RXD
7 RTS	4 RTS
8 CTS	5 CTS

MM Adapter Pinouts

Table D-6 provides the pinouts of the MM adapter. The MM adapter is a DB9-to-RJ-45 RS-232 crossover adapter. The MM adapter is attached to the WTI switch for connection with the COM 1/2 ports on the USM I/O adapter of the USD-X.

Table D-6 MM Adapter Pinouts

RJ-45 Pin Out	DB9 Pin Out (EE Adapter)
1 DSR	4 DTR
2 DCD	Note: This pin connects to RJ45 pins 1 and 2.
3 DTR	6 DSR
Note: This pin connects to DB9 pins 6 and 1.	1 DCD
4 GND	5 GND
6 RXD	3 TXD
6 TXD	2 RXD
7 CTS	7 RTS
8 RTS	8 CTS

NN Adapter Pinouts

Table D-7 provides the pinouts of the NN adapter. The NN adapter is a DB9-to-RJ-45 RS-232 crossover adapter. The NN adapter is attached to the WTI switch for connection with the HMB3 board of the USD-X.

Table D-7 NN Adapter Pinouts

RJ-45 Pin Out	DB9 Pin Out (EE Adapter)
1 DTR	1 DCD
Note: This pin connects to DB9 pins 1 and 6.	6 NC
2 DSR	4 DTR
3 DCD	Note: This pin connects to RJ45 pins 2 and 3.
4 GND	5 GND
5 TD	2 RD
6 RD	3 TD
7 RTS	8 CTS
8 CTS	7 RTS

PP Adapter Pinouts

Table D-8 provides the pinouts of the PP adapter. The PP adapter is a DB25-to-RJ-45 RS-232 crossover adapter. The PP adapter is attached to the Penril switch for connection with the modem.

Table D-8 PP Adapter Pinouts

RJ-45 Pin Out	DB25 Pin Out (EE Adapter)
1 DSR	20 DTR
2 DCD	4 RTS
3 DTR	6 DSR
4 SG	7 SG
5 RD	2 TD
6 TD	3 RD

Table D-8 PP Adapter Pinouts (Continued)

RJ-45 Pin Out	DB25 Pin Out (EE Adapter)
7NC CTS	5NC CTS
8 RTS	8 DCD

Pinout Initials

Table D-9 provides the full names of the pinout initials.

Table D-9 Pinout Initials

Initials	Full Name
DSR	Data Set Ready
DTR	Data Terminal Ready
DCD	Data Carrier Detect
GND	Ground
RXD	Receive Data
TXD	Transmit Data
CTS	Clear To Send
RTS	Request To Send

E

Fuse Voltage Information

This appendix provides the voltage information for the fuses on the F9112 midplane and F9106 midplane.

F9112 Fuse Voltage Information

Table E-1 provides fuse voltage information for F9112. Refer to Table 3-1 for information on fuse locations.

Table E-1 F9112 Fuse Voltage Information

Voltage	Fuse Numbers
+48 volts	1, 2, 9, 10, 17, 18, 25, 26, 33, 34, 41, 42, 49, and 55
48 return	3, 4, 11, 12, 19, 20, 27, 28, 35, 36, 43, 44, 50, and 56
-12 volts	7, 8, 15, 16, 23, 24, 31, 32, 39, 40, 47, 48, 52, and 58
+12 volts	5, 6, 13, 14, 21, 22, 29, 30, 37, 38, 45, 46, 51, and 57
+2.1	54
+5	53 and 59

F9106 Fuse Voltage Information

Use Table E-2 for F9106 fuse voltage information, for fuse locations see Table 3-2.

Table E-2 F9106 Fuse Voltage Information

Voltage	Fuse Numbers
+48 volts	1, 2, 9, 10, 17, 18 and 49
48 return	3, 4, 11, 12, 19, 20 and 50
-12 volts	7, 8, 15, 16, 23, 24 and 52
+12 volts	5, 6, 13, 14, 21, 22, and 51
+2.1	54
+5	53

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